AD-A101 909 GEOLOGICAL SURVEY HARRISBURG PA WATER RESOURCES DIV F/G 8/8
PREIMPOUNDMENT WATER QUALITY IN THE TIOGA RIVER BASIN, PENNSYLV--ETC(U)
MAR 81 J R WARD
UNCLASSIFIED USGS/WRD/WRI-81/068 NL

1 OF 2
AD A
101909

8

Preimpoundment Water Quality in the Tioga River Basin, Pennsylvania and New York

U.S. GEOLOGICAL SURVEY
WATER RESOURCES INVESTIGATIONS 81-1

Prepared in cooperation with the
U.S. Army Corps of Engineers, Baltimore District
Susquehanna River Basin Commission

50272-101

REPORT DOCUMENTATION PAGE	1. REPORT NO. USGS/WRD/WRI/81-068	2. AD-A101 909	3. Recipient's Accession No.

4. Title and Subtitle

PREIMPOUNDMENT WATER QUALITY IN THE TIOGA RIVER BASIN, PENNSYLVANIA AND NEW YORK

5. Report Date March 1981

6.

7. Author(s)

Janice R. Ward

8. Performing Organization Rept. No. USGS/WRI-81-1

9. Performing Organization Name and Address

U.S. Geological Survey
Water Resources Division
P.O. Box 1107, 228 Walnut Street
Harrisburg, Pennsylvania 17108

10. Project/Task/Work Unit No.

11. Contract(C) or Grant(G) No.

(C)

(G)

12. Sponsoring Organization Name and Address

U.S. Geological Survey
Water Resources Division
P.O. Box 1107, 228 Walnut Street
Harrisburg, Pennsylvania 17108

13. Type of Report & Period Covered

Final
Sept. 1973 - Sept. 1978

14.

15. Supplementary Notes

Prepared in cooperation with the U.S. Army Corps of Engineers, Baltimore District, and the Susquehanna River Basin Commission

16. Abstract (Limit: 200 words)

The water quality in the Tioga River basin was studied from September 1973 to September 1978, prior to impoundment by the U.S. Army Corps of Engineers. Results of the investigation will be used in the operation of three reservoirs that were in the final stages of construction in late 1979.

Annual suspended-sediment yields for the basin averaged 575 tons per square mile. Mill Creek near Tioga and the Cowanesque River upstream from Nelson were the smallest contributors. The suspended-sediment yields for some sites on the Tioga River and Crooked Creek were affected by reservoir construction.

Acid-mine drainage in the headwaters of the Tioga River increased the levels of sulfate, trace elements, and specific conductance, and decreased alkalinity and pH. For most of the river's length, nutrient levels are generally low, but high enough to support biological activity.

A discussion of the water quality of the three reservoirs after completion is included. Also included is a discussion of the possible effects of the reservoirs on existing water quality in the Tioga River.

17. Document Analysis a. Descriptors

*acidity, *alkalinity, *mine drainage, *water chemistry, *preimpoundment, *heavy metals, *nutrients, *phytoplankton, *reservoirs.

b. Identifiers/Open-Ended Terms

Tioga River, Susquehanna River basin, Pennsylvania, New York

c. COSATI Field/Group

18. Availability Statement	19. Security Class (This Report)	21. No. of Pages
Approved for public release; distribution unlimited. No restriction on distribution	UNCLASSIFIED	118
	20. Security Class (This Page) UNCLASSIFIED	22. Price

(See ANSI-Z39.18) See Instructions on Reverse

OPTIONAL FORM 272 (4-77)
(Formerly NTIS-35)
Department of Commerce

PREIMPOUNDMENT WATER QUALITY IN THE TIOGA RIVER BASIN, PENNSYLVANIA AND NEW YORK

By Janice R. Ward

U.S. GEOLOGICAL SURVEY

Water Resources Investigations 81-1

Prepared in cooperation with the
U.S. Army Corps of Engineers, Baltimore District
Susquehanna River Basin Commission

March 1981

UNITED STATES DEPARTMENT OF THE INTERIOR

JAMES G. WATT, Secretary

GEOLOGICAL SURVEY

Doyle G. Frederick, Acting Director

For additional information write to:

U.S. Geological Survey
Federal Building
P.O. Box 1107
Harrisburg, Pennsylvania 17108

CONTENTS

ILLUSTRATIONS

TABLES

FACTORS FOR CONVERTING INCH-POUND UNITS TO
INTERNATIONAL SYSTEM UNITS (SI)

Multiply inch-pound unit	By	To obtain SI units
foot (ft)	0.3048	meter (m)
mile (mi)	1.609	kilometer (km)
acre	4,407	square meter (m^2)
acre-foot (acre-ft)	1,233	cubic meter (m^3)
square mile (mi^2)	2.590	square kilometer (km^2)
cubic foot per second (ft^3/s)	0.02832	cubic meter per second (m^3/s)
cubic foot per second per square mile [$(ft^3/s)/mi^2$]	0.0109	cubic meter per second per square kilometer [$(m^3/s)/km^2$]
ton (short)	0.9072	megagrams (Mg)
tons per day per square mile [$(ton/d)/mi^2$]	0.3502	megagrams per day per square kilometer [$(Mg/d)/km^2$]
mho	1.000	siemen
degree Fahrenheit (°F)	°C = (°F-32)/1.8	degree Celsius (°C)

PREIMPOUNDMENT WATER QUALITY IN THE TIOGA RIVER BASIN, PENNSYLVANIA AND NEW YORK

By Janice R. Ward

ABSTRACT

The water quality in the Tioga River basin was studied from September 1973 to September 1978, prior to impoundment by the U.S. Army Corps of Engineers. Results of the investigation will be used in the operation of three reservoirs that were in the final stages of construction in late 1979.

Annual suspended-sediment yields for the basin averaged 575 tons per square mile. Mill Creek near Tioga and the Cowanesque River upstream from Nelson were the smallest contributors. The suspended-sediment yields for some sites on the Tioga River and Crooked Creek were affected by reservoir construction.

Acid-mine drainage in the headwaters of the Tioga River increased the levels of sulfate, trace elements, and specific conductance, and decreased alkalinity and pH. For most of the river's length, nutrient levels are generally low, but high enough to support biological activity.

Tioga Lake will be acidic and probably stratify chemically and thermally. High concentrations of heavy metals will accumulate near the bottom of the lake where oxidation of these metals will produce dissolved oxygen levels significantly lower than those near the surface. Hammond and Cowanesque Lakes will be alkaline and thermally stratified. They will probably support a warm-water fishery.

The addition of Hammond Lake water to the outflow from Tioga Lake will probably improve the water quality of the Tioga River below Tioga Dam. Releases from the multi-level withdrawal system will allow the water quality of the river to stabilize, and not be subject to the extreme low-flow conditions that have historically damaged aquatic life.

INTRODUCTION

The U.S. Geological Survey, in cooperation with the U.S. Army Corps of Engineers, and aided by the Susquehanna River Basin Commission, investigated the water quality of the Tioga River basin, Pennsylvania. The study, made from September 1973 to September 1978, was designed to evaluate water quality at various sites prior to impoundment. Results of the investigation will aid the Corps of Engineers in designing the operation of three reservoirs that were in the final stages of construction in late 1979.

Description of the Tioga River Basin

In Pennsylvania, the Tioga River flows southwestward from the Bradford County - Tioga County line toward Blossburg (fig. 1). From Blossburg it flows northward and joins the Cohocton River near Corning, N.Y., to form the Chemung River, a tributary to the Susquehanna River.

The part of the Tioga River basin included in this study encompasses 771 mi^2, 690 mi^2 in Pennsylvania and 81 mi^2 in New York. The basin is characterized by steep, rounded hills, and wide valleys typical of the Allegheny Plateau physiographic province. The geologic formations are comprised of sands and gravels of Pleistocene age; sandstones, shales, and bituminous coals of Pennsylvanian age; and sandstones, shales, and conglomerates of Devonian age. The coals, belonging to the Pottsville and Allegheny Formations, are confined to an area around Blossburg, in the headwaters of the Tioga River. Coal has been both strip and deep mined, and many older mines remain unreclaimed. Some limited strip mining is currently underway near Blossburg.

Average annual precipitation measured near Wellsboro, Pa., is about 38 inches, based on 70 years of record. The average annual precipitation for the 5-year period of the study was 38.1 inches. Air temperatures averaged 44°F for the study period, 4° lower than the 70-year average.

Agriculture and forestry are the major land uses. Most of the population is scattered throughout rural areas or in small towns; Mansfield, Westfield, and Elkland are the principal communities.

Mine drainage enters and degrades the water quality of the Tioga River near Blossburg. The effects of this degradation have been observed from Blossburg to Corning, N.Y., 38 miles downstream (Rhodes and Davis, 1968; Barker, 1972; U.S. Army Corps of Engineers, 1974; Ward, 1976). Within the study area, there are three major tributaries, Mill Creek (near Tioga), Crooked Creek, and the Cowanesque River, which are unaffected by mine drainage. These tributaries help neutralize and dilute the acid-mine drainage in the Tioga River. Land use in Mill Creek basin (near Tioga) is mostly forested and agricultural. Both Crooked Creek and the Cowanesque River have some municipal and industrial inputs, but still have reasonably good water quality.

Location and Description of Reservoirs

Three flood-control reservoirs (fig. 2), nearing completion in 1979, were designed to prevent floods like those that occurred in 1865, 1946, and 1972. Stage reduction below the reservoirs during storms will reduce damages in flood-prone areas along the Tioga, Chemung, and Susquehanna Rivers. The physical characteristics of the reservoirs are given in table 1.

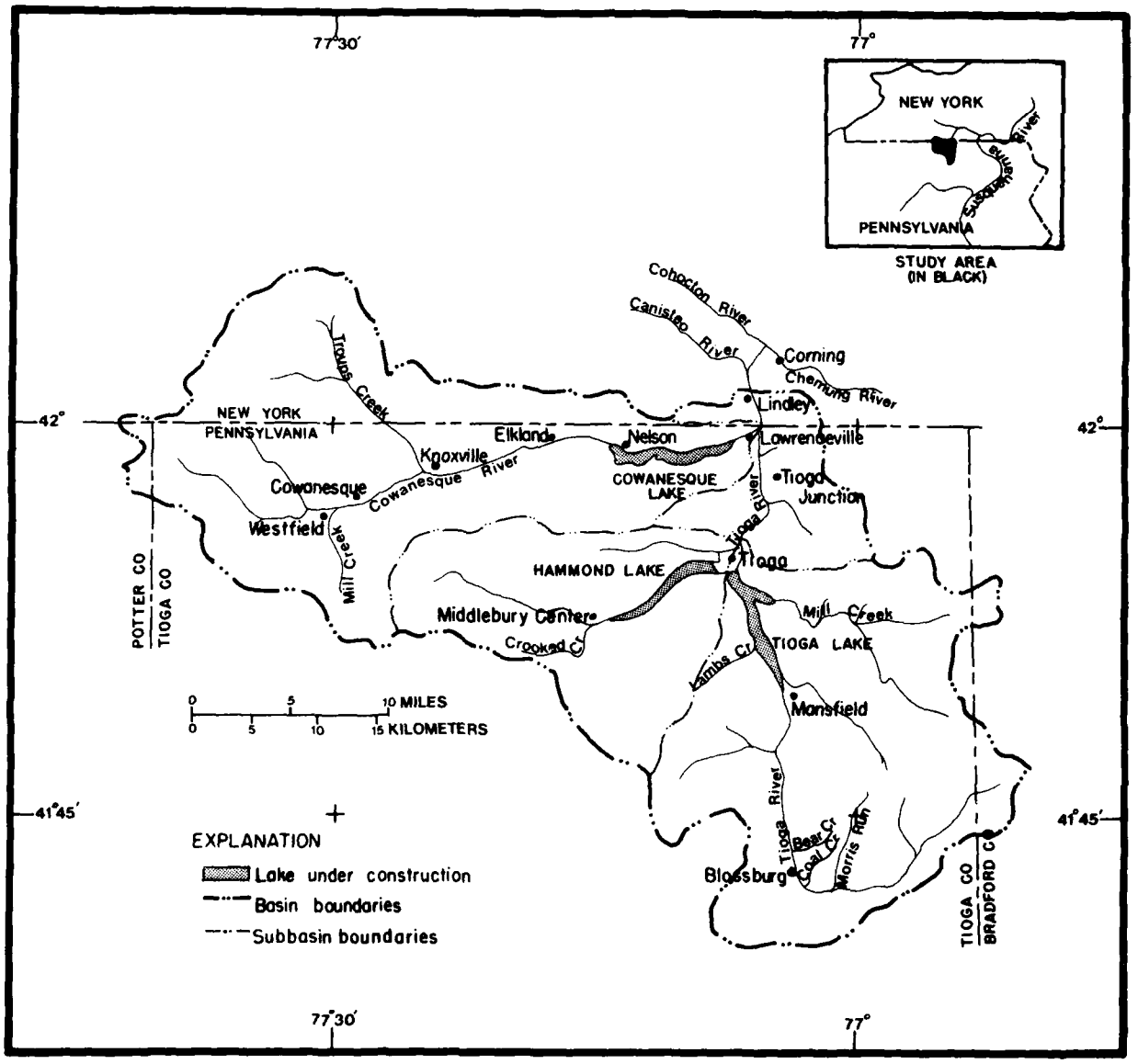


Figure 1.--The Tioga River basin above Lindley.

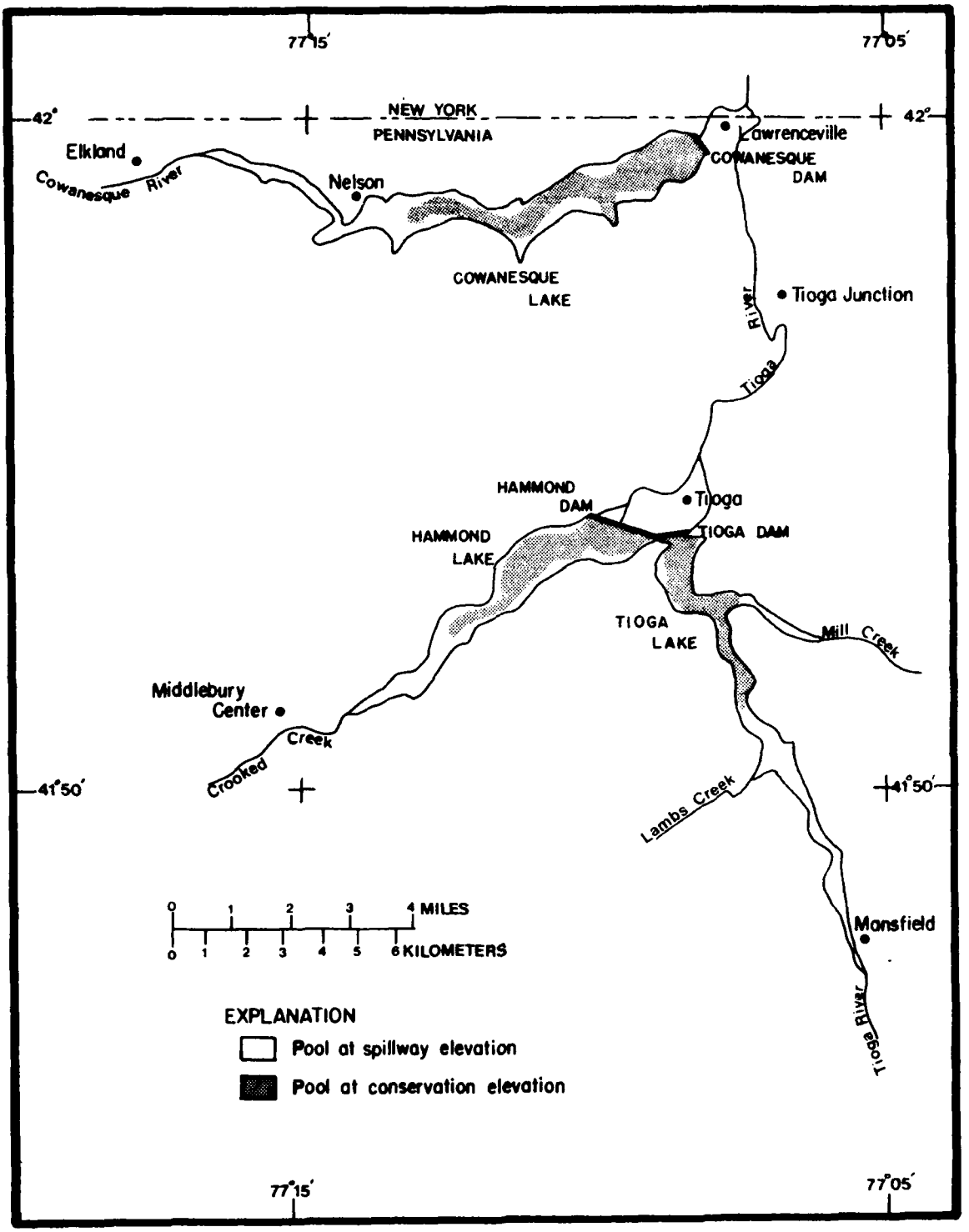


Figure 2.--Tioga, Hammond, and Cowanesque Lakes.

Table 1.--Physical characteristics of Tioga, Hammond, and Cowanesque Lakes

	Tioga Lake	Hammond Lake	Cowanesque Lake
Drainage area (mi^2)	280	122	298
Pool at conservation elevation:			
Surface area (acres)	480	660	410
Storage (acre-ft)	9,600	8,800	6,975
Mean depth (ft)	20	13	17
Maximum depth (ft)	50	39	45
Pool at spillway elevation:			
Storage (acre-ft)	62,000	63,000	89,000

Tioga Lake is being constructed on the Tioga River, 1.7 miles upstream from the confluence with Crooked Creek, and, after completion, will extend about 10 miles upstream to Mansfield at spillway elevation. The major inflows to the lake are the Tioga River and Mill Creek (near Tioga). Tioga Lake's outlet to the Tioga River will be at the west abutment of Tioga Dam and will be equipped for multilevel withdrawal.

Hammond Lake is being constructed on Crooked Creek, 3.3 miles upstream from the mouth, and, after completion, will extend about 8 miles upstream toward Middlebury Center at spillway elevation. Crooked Creek is the major inflow to Hammond Lake. A small uncontrolled outlet in Hammond Dam will sustain flow in Crooked Creek below the dam. A connecting channel joining Tioga and Hammond Lakes will enable the lakes to be operated as a single flood control unit. During periods of normal streamflow most of the discharge from Hammond Lake will be through the connecting channel into Tioga Lake. Flood flows will pass from Tioga Lake into Hammond Lake via the connecting channel and then to Crooked Creek via the emergency spillway.

Cowanesque Lake is being constructed 2.2 miles upstream from the mouth of the Cowanesque River and, after completion, will extend about 8 miles upstream toward Elkland at spillway elevation. The Cowanesque River is the major inflow to the lake. Outflow to the Cowanesque will be through a multilevel outlet works during normal flows and over an ungated spillway during flood flows.

SAMPLING NETWORK AND DATA-COLLECTION METHODS

Water-quality samples were collected and streamflow measured at various sites on a monthly basis from September 1973 to September 1978. All sampling sites and their drainage areas are listed in table 2; locations of the sites are shown in figure 3. The analyses performed on water samples collected are listed in table 3. Analyses were performed either on filtered water samples for dissolved concentrations or on unfiltered water samples for total concentrations, but at times both kinds of samples were analyzed.

Water samples were collected from stream cross sections using depth-integrated water-suspended sediment sampling techniques (Guy and Norman, 1970). Streamflow measurements were made according to techniques described by Buchanan and Somers (1976). Field measurements and sample preservation techniques used are described in Brown and others (1970) and Greeson and others (1977). Chemical samples were analyzed in the Geological Survey laboratories in Harrisburg, Pa., and Doraville, Ga. The methods used for the chemical analyses are documented in Skougstad and others (1979).

Specific conductance, water temperature, pH, and dissolved oxygen were monitored every 30 minutes for periods of 3 to 7 days at the four sampling sites nearest to the inflows of the reservoirs: Tioga River at Lambs Creek, Mill Creek near Tioga, Crooked Creek at Middlebury Center, and Cowanesque River at Nelson. The measurements were periodically made during different seasons by a NERA 4 water-quality monitor.[1/] The monitor was calibrated in the laboratory and adjusted as necessary after installation at the sampling site. Field measurements were made at the beginning and end of the period to check the calibration of the monitor.

STREAMFLOW CHARACTERISTICS

The streamflows in the Tioga River basin were assessed using long-term gaging records from four stations: Tioga River at Tioga (1939-78), Crooked Creek at Tioga (1954-74), Cowanesque River near Lawrenceville (1953-78), and Tioga River at Lindley (1931-78). Table 4 lists flow-duration data for these sites for both the long-term period of record and the short-term period of the study. Streamflow records for 1978 at Tioga River at Tioga are not included in table 4 because these records include flow diverted from Crooked Creek to the Tioga River during construction of the reservoirs. Also included in table 4 are duration tables for two gaging stations established in 1976: Tioga River near Mansfield and Tioga River at Tioga Junction.

[1/] Use of a brand name in this report is for identification purposes only and does not imply endorsement by the U.S. Geological Survey.

Table 2.--Sampling sites and drainage areas

Station identification number	Site name	Drainage area (mi^2)
01516350	Tioga River near Mansfield[1]	153
01516820	Tioga River at Lambs Creek	186
01517500	Mill Creek near Tioga	76.8
01518000	Tioga River at Tioga[1]	282
01518400	Crooked Creek at Middlebury Center[1]	71.5
01518500	Crooked Creek at Tioga (1)[1,2]	122
01518550	Crooked Creek at Tioga (2)[2]	131
01518700	Tioga River at Tioga Junction[1]	446
01518850	Cowanesque River at Westfield	53.0
01518860	Mill Creek at Westfield	13.0
01518870	Cowanesque River at Cowanesque	91.0
01519000	Troups Creek at Knoxville	66.5
01519500	Cowanesque River at Nelson	266
01520000	Cowanesque River near Lawrenceville[1]	298
01520500	Tioga River at Lindley[1]	771

[1] Caging station.

[2] Crooked Creek at Tioga (1) had to be relocated 0.5 mile downstream because of construction to Crooked Creek at Tioga (2).

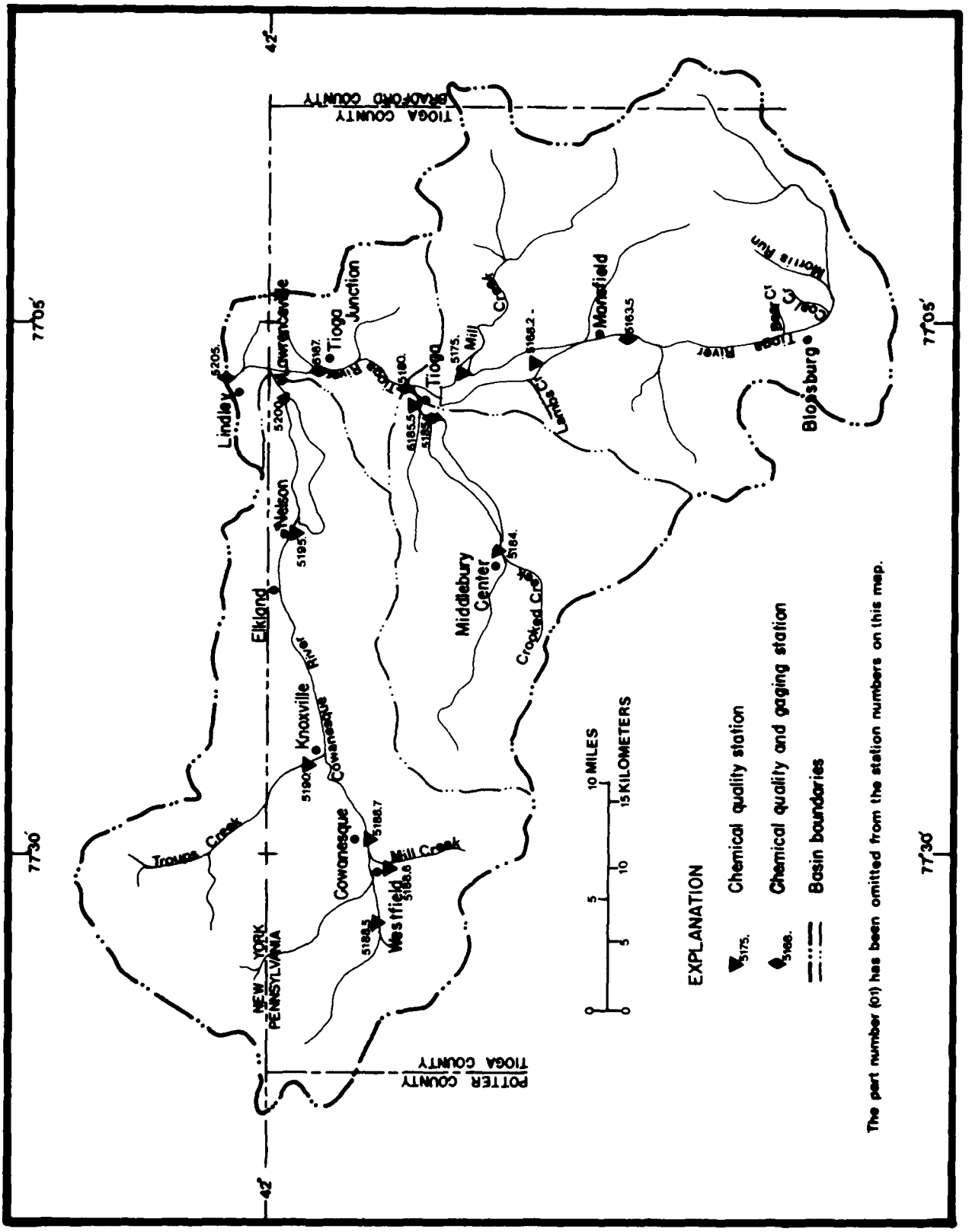


Figure 3.--Sampling sites.

Table 3.--Physical, chemical, and biological analyses performed on water samples

Field measurements	Chemical analyses (mg/L)	
Streamflow (ft^3/s)	Bicarbonate	Nitrite-plus-nitrate nitrogen
Water temperature (°C)	Carbonate	Ammonia nitrogen
pH (units)	Sulfate	Kjeldahl nitrogen
Specific conductance (micromhos at 25°C)	Chloride	Total phosphorus
	Calcium	Orthophosphate
Alkalinity (mg/L as $CaCO_3$)	Magnesium	Suspended sediment
Acidity (mg/L as $CaCO_3$)	Sodium	
Dissolved oxygen (mg/L)	Potassium	

Biological analyses	Chemical analyses (µg/L)	
Algal growth potential (mg/L)	Aluminum	Lead
Fecal coliform (colonies/100 mL)	Arsenic	Manganese
Fecal streptococci (colonies/100 mL)	Cadmium	Mercury
Chlorophyll A (mg/L)	Chromium	Selenium
Chlorophyll B (mg/L)	Cobalt	Silver
Total phytoplankton (cells/mL)	Copper	Zinc
Phytoplankton identification and count (cells/mL)	Iron	

Table 4.--Flow-duration tables for six gaged sites

Site name and period of record	Drainage area (mi^2)	Minimum flow (ft^3/s)	Streamflow, in cubic feet per second, that is equaled or exceeded the indicated percentage of time							Maximum flow (ft^3/s)
			95	90	75	70	50	25	10	
Tioga River near Mansfield										
(1976-78)	153	14	19	31	40	43.	71	190	430	8,940
Tioga River at Tioga										
(1939-77)	282	4.5	17	24	48	59	130	370	790	59,000
(1974-77)		20	32	43	57	62	110	320	690	33,000
Crooked Creek at Tioga (1)										
(1954-74)	122	1.8	4.3	6.3	13	15	35	110	270	21,000
Tioga River at Tioga Junction										
(1976-78)	446	26	37	60	99	110	180	360	940	17,900
Cowanesque River near Lawrenceville										
(1953-77)	298	0.8	6.0	10	27	36	94	290	690	43,700
(1974-77)		10	21	25	33	38	90	300	750	43,700
Tioga River at Lindley										
(1931-78)	771	6.1	34	49	110	130	300	850	1,900	128,000
(1974-78)		44	80	86	100	110	190	650	1,400	80,600

Regression techniques were used to relate monthly streamflows measured at the ungaged sites, Tioga River at Lambs Creek, Mill Creek near Tioga, Crooked Creek at Middlebury Center, and Cowanesque River at Nelson, to those at nearby gaged sites. The resulting regression coefficients are shown in table 5 in the following form:

$$\log y = \log a + b \log x \qquad \text{(eq. 1)}$$

Flow-duration tables for the ungaged sites (table 6), were calculated using flow-duration data from the gaged sites (table 4) and the regression coefficients in table 5. These data will be used in discussions of water-quality characteristics.

The streamflow measurements made at the time water-quality samples were collected are summarized in table 7. Samples were collected over a wide range of streamflow, but because of the monthly sampling schedule, there was not coverage over storms. Therefore, water-quality concentrations measured are not representative of stormflows.

WATER-QUALITY CHARACTERISTICS

Suspended Sediment

Water was sampled daily for suspended sediment at Tioga River at Lindley beginning in August 1974 (U.S. Geological Survey, 1975-79). The average yearly suspended-sediment yield for Tioga River at Lindley for water years 1975-78 is 575 tons/mi^2. Runoff from two storms during this period transported large amounts of sediment. The sediment yield during Hurricane Eloise, in September 1975, was about 260 tons/mi^2, and during a storm in June 1976 it was about 130 tons/mi^2. Particle-size data indicate that the average storm sample contains about 8 percent sand, 49 percent silt, and 42 percent clay.

Monthly suspended-sediment samples were collected at 14 other sites in the basin. Table 8 lists the maximum, minimum, and median suspended-sediment concentrations, discharges, and yields of the monthly samples. Because the data were collected monthly, stormflows were not sampled, and the actual true extreme and median suspended-sediment discharges may vary greatly from those shown. Mill Creek near Tioga and the Cowanesque River basin sites, except Lawrenceville, had the lowest suspended-sediment concentrations and yields. The sites on the Tioga River, Crooked Creek, and the Cowanesque River near Lawrenceville had high maximum concentrations. These high values were partly caused by construction of the reservoirs and adjacent highways at these sites.

Table 5.—Regression coefficients relating flow data from ungaged sites to flow data at gaged sites

y	log a	b	x Streamflow measured at	Standard error	Number of observations
Tioga River at Lambs Creek	0.07	0.99	Tioga River near Mansfield	0.04	12
Mill Creek near Tioga	-.68	1.03	Tioga River at Lambs Creek	.13	42
Crooked Creek at Middlebury Center	-.57	1.13	Crooked Creek at Tioga (1)	.12	10
Cowanesque River at Nelson	-.09	1.02	Cowanesque River near Lawrenceville	.04	22

Table 6.—Flow-duration tables for four ungaged sites computed from flow relationships with nearby gages

Site name and period of gaging record on which duration table is based	Drainage area (mi^2)	Streamflow, in cubic feet per second, that is equaled or exceeded the indicated percentage of time						
		95	90	75	70	50	25	10
Tioga River at Lambs Creek (1976-78)	186	22	35	45	49	80	210	480
Mill Creek near Tioga (1976-78)	76.8	5.0	8.2	10.6	11.5	19	52	120
Crooked Creek at Middlebury Center (1954-76)	71.5	1.4	2.2	4.9	5.7	15	55	150
Cowanesque River at Nelson (1953-77)	266	5.0	8.5	23	31	84	260	640
(1974-77)		18	22	29	33	80	270	700

Table 7.--Range and median of monthly discharge measurements

Site name	Period of record	Instantaneous streamflow (ft^3/s) maximum	minimum	median
Tioga River near Mansfield	May 1975-Apr. 1976, Feb. 1978	699	28	242
Tioga River at Lambs Creek	Sept. 1973-Sept. 1978	1,780	29	149
Mill Creek near Tioga	Sept. 1973-Sept. 1978	473	6.3	45
Tioga River at Tioga[1/]	Sept. 1973-Sept. 1977	4,220	30	205
Crooked Creek at Middlebury Center	Sept. 1973-Aug. 1974, Apr. 1976-Sept. 1978	453	3.3	28
Crooked Creek at Tioga (1)	Sept. 1973-Mar. 1975	811	10	66
Crooked Creek at Tioga (2)	Apr. 1975-Sept. 1978	260	.50	48
Tioga River at Tioga Junction	Sept. 1973-Sept. 1978	3,960	45	311
Cowanesque River at Westfield	Sept. 1973-Aug. 1974	272	3.1	18
Mill Creek at Westfield	Sept. 1973-Aug. 1974	59	1.2	7.2
Cowanesque River at Cowanesque	Sept. 1973-Aug. 1974	540	7.6	33
Troups Creek at Knoxville	Sept. 1973-Aug. 1974	312	2.6	14
Cowanesque River at Nelson	Sept. 1973-Aug. 1974, Apr. 1976-Sept. 1977	1,430	16	136
Cowanesque River near Lawrenceville	Sept. 1973-Sept. 1977	1,400	17	180
Tioga River at Lindley	Sept. 1973-Sept. 1977	3,260	63	478

[1/]The majority of streamflow was diverted from Crooked Creek at Tioga (2) to Tioga River at Tioga during the 1978 water year.

Table 8.--Summary of instantaneous suspended-sediment data

Site name	Period of record	Concentration (mg/L)			Suspended sediment Discharge (ton/d)			Yield (ton/d)/mi^2	
		maximum	minimum	median	maximum	minimum	median	maximum	median
Tioga River at Mansfield	May 1975-Apr. 1976, Feb. 1978	389	1	15	734	0.05	12	4.8	0.078
Tioga River at Lambs Creek	Sept. 1973-Sept. 1978	336	1	14	612	.05	4.4	3.3	.024
Mill Creek near Tioga	Sept. 1973-Sept. 1978	44	1	1	27	.05	.05	.35	.001
Tioga River at Tioga[1/]	Sept. 1973-Sept. 1978	176	1	14	877	.05	8.5	3.1	.030
Crooked Creek at Middlebury Center	Sept. 1973-Aug. 1974, April 1976-Sept. 1978	115	1	6	93	.05	.25	1.3	.003
Crooked Creek at Tioga (1)	Sept. 1973-March 1975	289	1	18	633	.05	3.6	5.2	.030
Crooked Creek at Tioga (2)	April 1975-Sept. 1978	4,500	1	16	911	.05	2.1	7.0	.016
Tioga River at Tioga Junction	Sept. 1973-Sept. 1978	894	1	16	7,000	.05	13	16	.029
Cowanesque River at Westfield	Sept. 1973-Aug. 1974	21	1	2	15	.05	.05	.28	.001
Mill Creek at Westfield	Sept. 1973-Aug. 1974	27	1	5	1.7	.05	.05	13	.004
Cowanesque River at Cowanesque	Sept. 1973-Aug. 1974	32	1	2	47	.05	.13	.52	.001
Troups Creek at Knoxville	Sept. 1973-Aug. 1974	69	1	4	53	.05	.10	.80	.002
Cowanesque River at Nelson	Sept. 1973-Aug. 1974, Apr. 1976-Sept. 1977	612	1	6	1,980	.05	1.4	7.4	.005
Cowanesque River near Lawrenceville	Sept. 1973-Sept. 1977	996	1	5	2,740	.05	2.8	9.2	.009
Tioga River at Lindley	Sept. 1973-Sept. 1977	1,230	1	18	4,650	.05	12	6.0	.016

[1/]The majority of streamflow was diverted from Crooked Creek at Tioga (2) to Tioga River at Tioga during the 1978 water year.

The relations between streamflow and instantaneous suspended-sediment yields, based on monthly measurements, for the Tioga River sites (fig. 4), Mill Creek near Tioga and the Crooked Creek sites (fig. 5), and the Cowanesque River sites (fig. 6) have standard errors of estimate that range from 0.30 to 0.62. Figure 4 shows that when streamflow yield is 6 $(ft^3/s)/mi^2$, suspended-sediment yields for the Tioga River varied from 0.88 $(ton/d)/mi^2$ at Tioga to 2.3 $(tons/d)/mi^2$ at Mansfield. Sediment yields for the Tioga River at Lambs Creek, at Tioga Junction, and at Lindley averaged about 1.3 $(tons/d)/mi^2$ at the same streamflow yield. Variations between yields at the Mansfield and Tioga sites and those at the other three Tioga sites may be due in part to the large standard error at Mansfield (0.62), where only a small number of samples were collected, and the reduction of suspended-sediment yields in the Tioga River by the dilution provided by Mill Creek just upstream from Tioga. When streamflow was less than 2 $(ft^3/s)/mi^2$, all of the sites had approximately equal sediment yields.

Reservoir construction at Tioga on Crooked Creek temporarily raised sediment concentrations as shown in figure 5. Before construction began, the sediment yields of Crooked Creek at Tioga (1) were about three times those upstream at Crooked Creek at Middlebury Center for streamflow yields ranging from about 0.5 to 6 $(ft^3/s)/mi^2$. During construction the sediment yields at Crooked Creek at Tioga (2) were about six times those observed at Middlebury Center, above the construction and near the inlet of the proposed reservoir.

Mill Creek near Tioga discharges significantly less sediment than the Tioga River or Crooked Creek. At streamflow yields of 6 $(ft^3/s)/mi^2$, sediment yield from the Mill Creek basin was 0.10 $(tons/d)/mi^2$, only about 10 percent of the yield from the Tioga River basin.

Sediment yields of Mill Creek at Westfield (fig. 6) were smaller than those measured anywhere along the Cowanesque River, and are similar to those measured at Mill Creek near Tioga. The Cowanesque River at Cowanesque had a slightly higher yield than at Westfield, probably because of the influence of Mill Creek, which tends to dilute Cowanesque River at Westfield. The other four sites in the Cowanesque River basin downstream of Cowanesque yielded about five times more sediment than did Westfield or Cowanesque at streamflow yields of 6 $(ft^3/s)/mi^2$. The sediment yields at these four sites are similar to those measured at the Tioga River sites.

The data presented in tables 4 and 6 and in figures 4, 5, and 6 can be used to estimate probable suspended-sediment discharges into the three lakes. Through the use of a regression equation corresponding to the stream of interest, the suspended-sediment discharge at any flow can be found. The large standard errors of the logarithmic regression analyses probably result from the lack of sufficient storm coverage. Sediment discharges during storms can be best estimated by using data from Tioga River at Lindley, since data at this site were collected during storms.

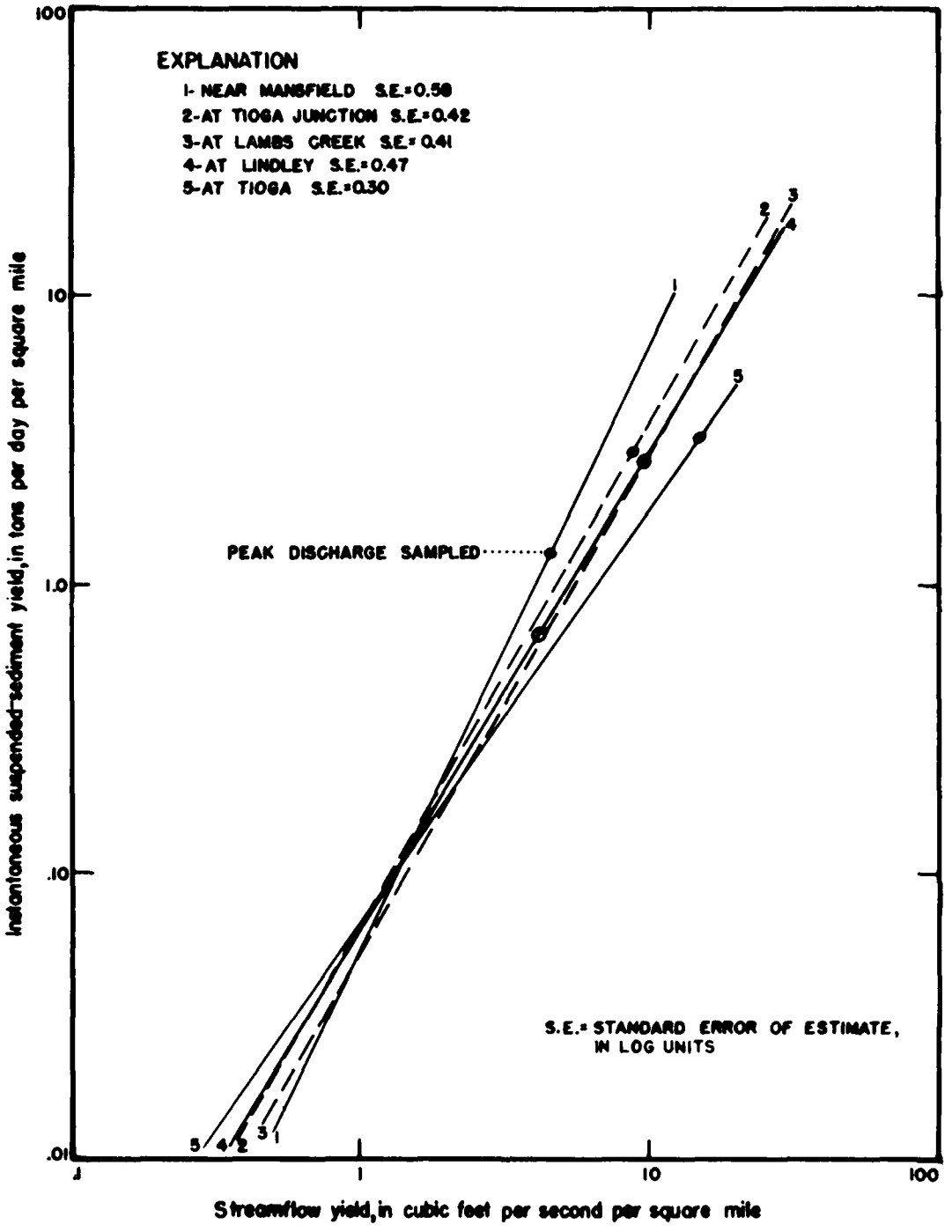


Figure 4.--Regression curves of streamflow and instantaneous suspended-sediment yields for Tioga River sites.

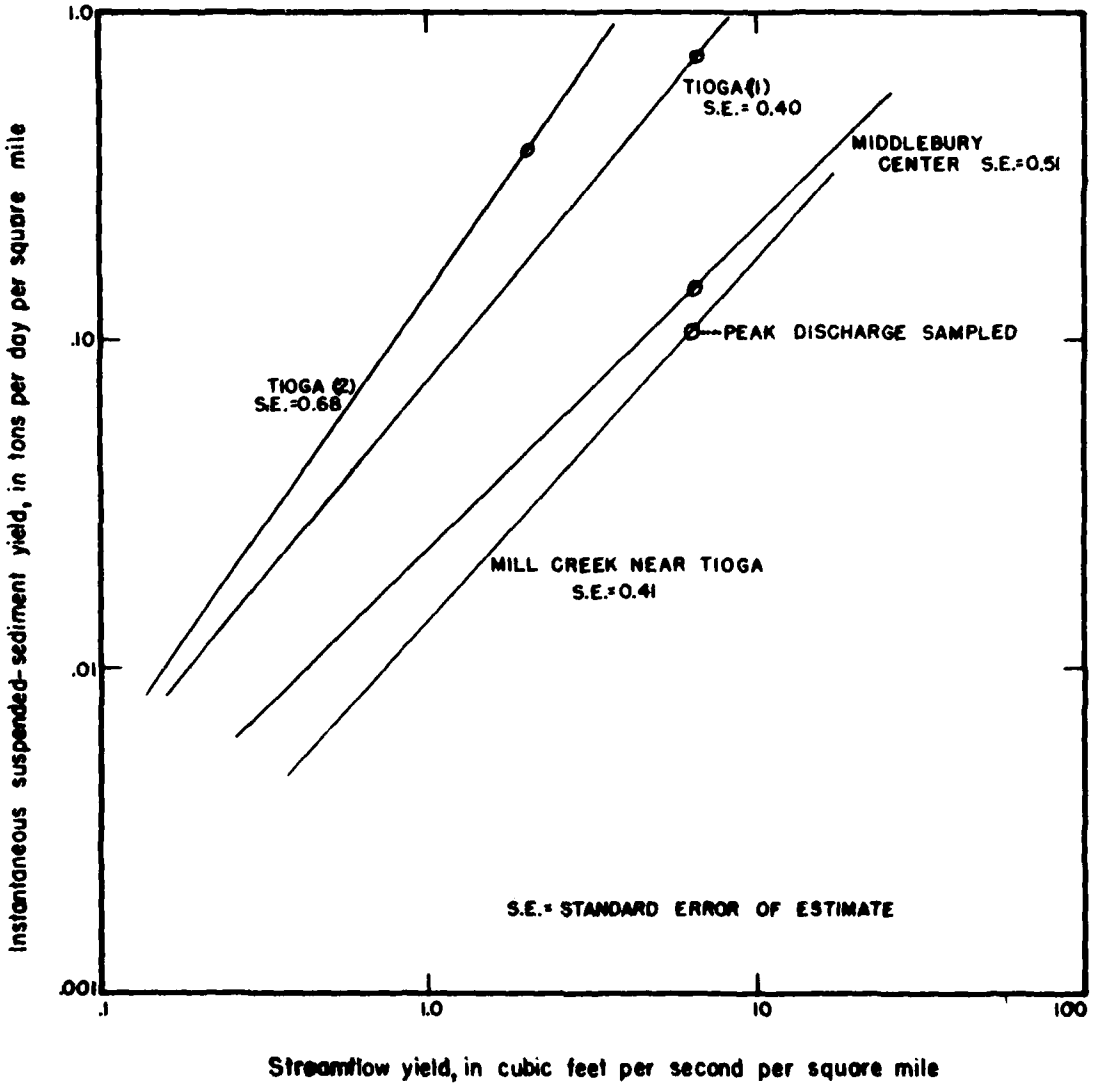


Figure 5.--Regression curves of streamflow and instantaneous suspended-sediment yields for Mill Creek near Tioga and Crooked Creek sites.

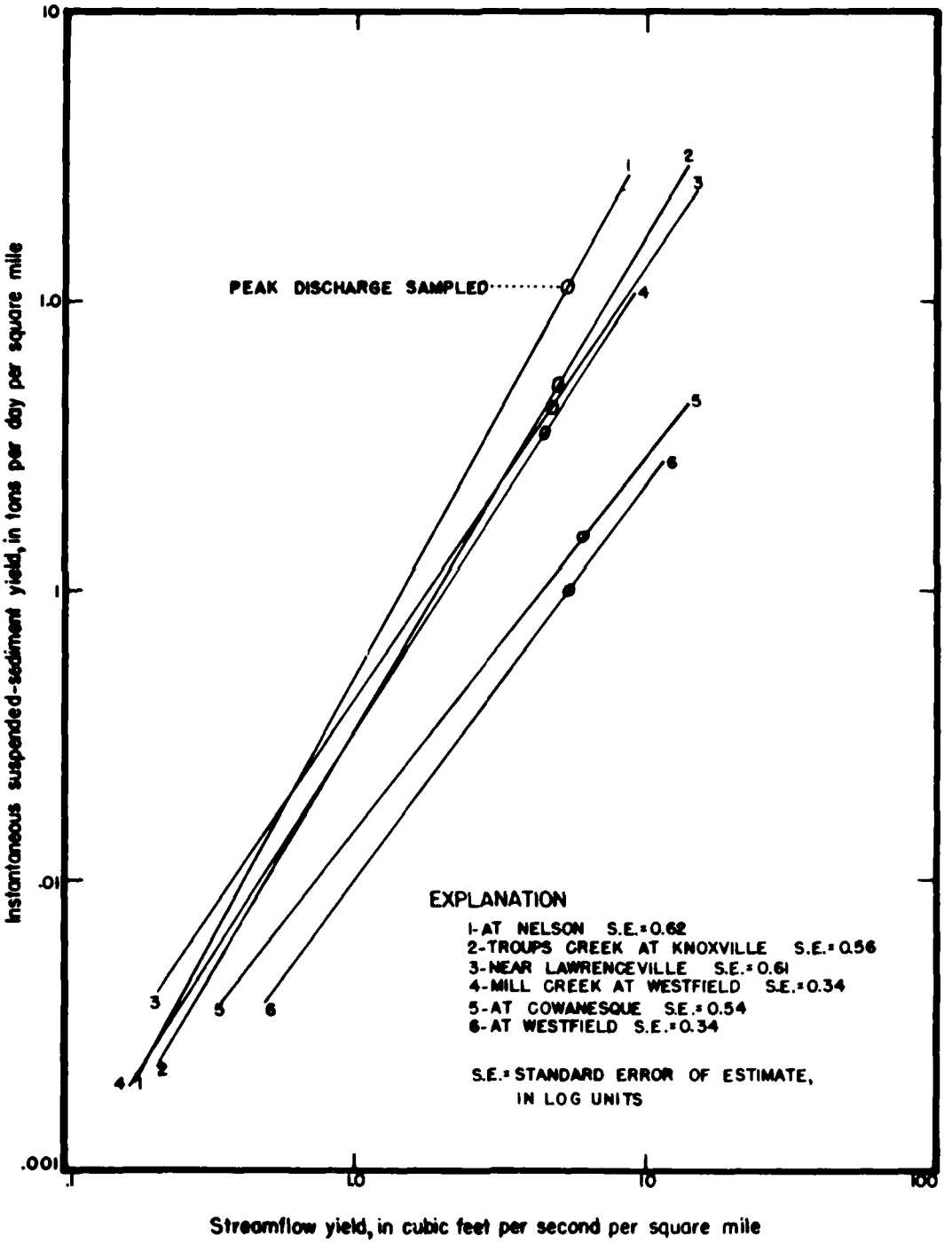


Figure 6.--Regression curves of streamflow and instantaneous suspended-sediment yields for Cowanesque River sites.

Specific Conductance and Major Dissolved Ions

The constituents discussed in this section are specific conductance, calcium, magnesium, sodium, potassium, sulfate, chloride, and dissolved oxygen. Tables 9 and 10 summarize the data. Because dissolved oxygen was near saturation at all sites during the monthly measurements, the data are not included in the tables. The shallow streams were aerated rapidly in riffle areas, replacing any oxygen consumed by chemical or biological oxygen demands. Diel fluctuations of dissolved oxygen at selected sites are discussed later.

Specific conductance values were highest at the upper Tioga River sites because of acid-mine discharges into the headwaters. The maximum specific conductance measured at the Tioga River near Mansfield was 608 µmho/cm, and the median was 231 µmho/cm. Dilution by Mill Creek (near Tioga) decreased the median value at Tioga River at Tioga Junction to 190 µmho/cm and the maximum almost by half, to 364 µmho/cm. High specific conductances in the Cowanesque River basin were measured at Mill Creek at Westfield (368 µmho/cm) and Cowanesque River at Cowanesque (572 µmho/cm). The Cowanesque River at Lawrenceville had a median specific conductance of 124 µmho/cm, which was slightly higher than that measured just upstream of the Tioga River at Tioga Junction (102 µmho/cm). Because of this, the Cowanesque River had relatively little impact on the Tioga River in terms of specific conductance.

Dissolved sulfate concentrations were highest in the upper Tioga River because of acid-mine discharges, and were decreased by dilution with water from Mill Creek (near Tioga), Crooked Creek, and the Cowanesque River. Both the maximum and median levels of sulfate were reduced by half on the Tioga River between Mansfield (maximum 250 mg/L) and Lindley (maximum 110 mg/L).

The Cowanesque River was the largest contributor of dissolved chloride in the basin, probably because of industrial activity. The maximum concentration measured was 93 mg/L at Cowanesque. Background levels of chloride measured along the Tioga River increased between Tioga River at Tioga Junction and Tioga River at Lindley because of the contributions from the Cowanesque River; maximum levels increased from 10 to 20 mg/L, and median levels were raised from 5.5 to 8.5 mg/L.

Calcium, magnesium, sodium, and potassium were nearly equivalent at the six sites sampled (table 10). Observed concentrations indicated moderately hard water. The concentrations of these constituents are inversely related to streamflow, and the logarithmic regression coefficients are given in table 11.

Table 9.--Summary of specific conductance, dissolved sulfate, and chloride data

Site name	Period of record	Specific conductance (micromho/cm at 25°C) maximum	minimum	median	Sulfate (milligrams per liter) maximum	minimum	median	Chloride (milligrams per liter) maximum	minimum	median
Tioga River near Mansfield	May 1975-Apr. 1976, Feb. 1978	608	118	231	250	38	100	8.5	3.0	4.2
Tioga River at Lambs Creek	Sept. 1973-Sept. 1978	587	109	246	260	28	98	13	2.0	5.8
Mill Creek near Tioga	Sept. 1973-Sept. 1978	214	79	148	28	8.2	17	10	2.3	5.5
Tioga River at Tioga[1/]	Sept. 1973-Sept. 1978	429	105	194	188	27	68	12	2.1	6.0
Crooked Creek at Middlebury Center	Sept. 1973-Aug. 1974, Apr. 1976-Sept. 1978	255	85	179	25	13	18	13	2.2	7.6
Crooked Creek at Tioga (1)	Sept. 1973-Mar. 1975	221	111	146	28	15	19	10	1.9	5.0
Crooked Creek at Tioga (2)	Apr. 1975-Sept. 1978	259	85	172	28	14	18	10	2.0	6.2
Tioga River at Tioga Junction	Sept. 1973-Sept. 1978	364	102	190	150	25	53	10	2.1	5.5
Cowanesque River at Westfield	Sept. 1973-Aug. 1974	204	88	122	23	12	16	19	2.0	4.4
Mill Creek at Westfield	Sept. 1973-Aug. 1974	368	129	206	32	17	20	36	5.0	13
Cowanesque River at Cowanesque	Sept. 1973-Aug. 1974	572	114	220	54	17	25	93	4.0	24
Troups Creek at Knoxville	Sept. 1973-Aug. 1974	239	124	197	30	16	22	12	4.0	7.5
Cowanesque River at Nelson	Sept. 1973-Aug. 1974, Apr. 1976-Sept. 1977	393	133	220	43	5.3	24	49	5.1	16
Cowanesque River near Lawrenceville	Sept. 1973-Sept. 1977	375	124	194	39	14	25	44	5.0	12
Tioga River at Lindley	Sept. 1973-Sept. 1977	359	118	191	110	21	44	20	4.0	8.5

[1/] Data from 1978 water year were not included because of diversion of Crooked Creek water to Tioga River at Tioga.

Table 10.--Summary of dissolved calcium, magnesium, sodium, and potassium data collected in 1978

Site name	Calcium (mg/L)			Magnesium (mg/L)			Sodium (mg/L)			Potassium (mg/L)		
	maximum	minimum	median	maximum	minimum	median	maximum	minimum	median	maximum	minimum	median
Tioga River at Lambs Creek	44	10	26	25	4.5	13	7.3	2.6	5.2	2.4	1.2	1.7
Mill Creek near Tioga	28	9.2	18	5.1	1.6	3.2	5.0	2.2	3.8	2.3	1.4	2.0
Tioga River at Tioga[1/]	38	10	23	17	3.2	7.6	6.8	2.4	4.5	2.4	1.3	1.8
Crooked Creek at Middlebury Center	35	10	20	4.7	1.6	3.2	11	2.5	5.0	2.5	1.7	2.0
Crooked Creek at Tioga (2)	36	9.2	21	6.4	1.6	3.9	7.6	2.6	5.8	2.5	1.4	2.0
Tioga River at Tioga Junction	37	10	24	15	2.9	9.2	7.0	2.4	4.6	2.3	1.4	1.6

[1/]Data are affected by diversion of Crooked Creek water to Tioga River at Tioga.

Table 11.--Regression coefficients for the logarithms of streamflow to specific conductance, sulfate, chloride, calcium, magnesium, sodium, and potassium

Site name		log a	b	Standard error	Number of observations
Tioga River near Mansfield					
X	Y				
streamflow	specific conductance	3.37	-0.44	0.07	13
	sulfate	3.13	- .53	.12	13
	chloride	1.30	- .29	.09	13
Tioga River at Lambs Creek					
X	Y				
streamflow	specific conductance	3.22	- .37	.07	53
	sulfate	2.99	- .45	.11	53
	chloride	1.46	- .31	.11	53
	calcium	2.13	- .35	.04	7
	magnesium	2.00	- .42	.05	7
	sodium	1.22	- .26	.08	7
	potassium	.56	- .15	.06	7
Mill Creek near Tioga					
X	Y				
streamflow	specific conductance	2.45	- .18	.05	49
	sulfate	1.21	.02	.09	49
	chloride	1.06	- .20	.11	48
	calcium	1.57	- .20	.12	8
	magnesium	.88	- .25	.07	8
	sodium	.84	- .19	.05	8
	potassium	.46	- .12	.05	8
Tioga River at Tioga					
X	Y				
streamflow	specific conductance	3.09	- .33	.06	47
	sulfate	2.89	- .44	.09	47
	chloride	1.37	- .26	.12	47
	calcium	2.11	- .31	.03	8
	magnesium	1.96	- .44	.11	8
	sodium	1.24	- .24	.03	8
	potassium	.59	- .13	.06	8
Crooked Creek at Middlebury Center					
X	Y				
streamflow	specific conductance	2.52	- .19	.06	32
	sulfate	1.32	- .05	.09	32
	chloride	1.23	- .29	.11	32
	calcium	1.58	- .19	.13	8
	magnesium	.78	- .21	.05	8
	sodium	1.16	- .31	.08	8
	potassium	.41	- .08	.03	8
Crooked Creek at Tioga (1)					
X	Y				
streamflow	specific conductance	2.45	- .14	.05	18
	sulfate	1.22	.03	.06	18
	chloride	1.09	- .20	.14	18
Crooked Creek at Tioga (2)					
X	Y				
streamflow	specific conductance	2.56	- .19	.05	27
	sulfate	1.36	- .05	.05	27
	chloride	1.14	- .21	.09	27
	calcium	1.49	- .29	.11	7
	magnesium	.72	- .30	.07	7
	sodium	.85	- .28	.09	7
	potassium	.38	- .12	.05	7

Table 11.--Regression coefficients for the logarithms of streamflow to specific conductance, sulfate, chloride, calcium, magnesium, sodium, and potassium--(Continued)

Site name		log a	b	Standard error	Number of observations
Tioga River at Tioga Junction					
x	y				
streamflow	specific conductance	2.98	-0.28	0.05	55
	sulfate	2.64	- .35	.11	55
	chloride	1.46	- .27	.09	55
	calcium	2.13	- .32	.02	8
	magnesium	1.89	- .40	.07	8
	sodium	1.25	- .25	.04	8
	potassium	.43	- .08	.06	8
Cowanesque River at Westfield					
x	y				
streamflow	specific conductance	2.33	- .16	.05	10
	sulfate	1.15	.04	.09	10
	chloride	- 1.15	- .38	.22	10
Mill Creek at Westfield					
x	y				
streamflow	specific conductance	2.52	- .25	.04	10
	sulfate	1.38	- .05	.09	10
	chloride	1.51	- .46	.06	10
Cowanesque River at Cowanesque					
x	y				
streamflow	specific conductance	2.99	- .37	.10	10
	sulfate	1.79	- .23	.12	10
	chloride	2.51	- .70	.17	10
Troups Creek at Knoxville					
x	y				
streamflow	specific conductance	2.44	- .13	.04	10
	sulfate	1.36	- .02	.09	10
	chloride	1.04	- .16	.09	10
Cowanesque at Nelson					
x	y				
streamflow	specific conductance	2.82	- .23	.06	24
	sulfate	1.85	- .22	.06	24
	chloride	2.20	- .48	.12	24
Cowanesque River near Lawrenceville					
x	y				
streamflow	specific conductance	2.89	- .26	.05	47
	sulfate	1.73	- .16	.06	47
	chloride	2.26	- .52	.11	47
Tioga River at Lindley					
x	y				
streamflow	specific conductance	3.02	- .27	.06	49
	sulfate	2.51	- .32	.11	48
	chloride	1.97	- .38	.09	49

Duration tables of specific conductance and sulfate concentration were computed for 10 sites (table 12), based on the regression analyses and flow-duration tables for each site. These data summarize the water quality at the inflows and outflows to each reservoir and at the downstream limit of the study.

pH, Carbonate, and Bicarbonate

The alkalinity and acidity of a water sample are measures of its buffering capacity, or the ability to assimilate additions of acid or base without a corresponding change in pH. Carbonate, bicarbonate, and carbonic acid comprise the equilibrium that controls the buffering capacity of the water in many streams, including the Tioga River basin.

A water sample that has a pH between 4.5 and 8.3 contains both alkalinity and acidity. If the pH is greater than 8.3, the sample contains only alkalinity, as a mixture of carbonate and bicarbonate. If the pH is less than 4.5, only acidity, which can be a combination of carbonic, sulfuric, and other acids, and many types of mineral complexes, is present.

Once the alkalinity and acidity of a water sample are measured, the net alkalinity of the sample can be computed as follows:

Net alkalinity = measured alkalinity - measured acidity
(mg/L as $CaCO_3$) (mg/L as $CaCO_3$) (mg/L as $CaCO_3$)

A positive net alkalinity indicates that the water sample is more alkaline than acidic, and a negative net alkalinity indicates that a water sample is more acidic than alkaline.

Data collected for the Tioga study are summarized in table 13. As expected, the pH and net alkalinity of the Tioga River are lowest near its headwaters due to acid-mine drainage from coal mines near Blossburg, but increase in a downstream direction. The major tributaries to the Tioga River are alkaline and help to neutralize and dilute the acid-mine discharge. The minimum pH necessary to sustain a warm-water fishery is 6.0 (Moran and Wentz, 1974). This pH was not maintained at all times anywhere in the Tioga River basin above Lindley.

Table 12.--Duration tables for specific conductance and sulfate concentration for 10 sites

Site name and period of flow record	Value of parameter which is equalled or exceeded the indicated percentage of time													
	Specific conductance, in micromhos per centimeter at 25°C							Sulfate concentration, in milligrams per liter						
	95	90	75	70	50	25	10	95	90	75	70	50	25	10
Tioga River near Mansfield (1976-78)	160	230	360	450	460	520	640	54	84	140	180	190	220	180
Tioga River at Lambs Creek (1976-78)	170	230	330	390	410	450	530	61	88	140	170	180	200	170
Mill Creek near Tioga (1976-78)	120	140	170	180	185	190	210	18	18	17	17	17	17	17
Tioga River at Tioga (1974-77)	140	180	260	310	320	360	390	44	61	98	130	130	150	130
Crooked Creek at Middlebury Center (1954-76)	130	150	200	240	250	280	310	16	17	18	19	19	20	19
Crooked Creek at Tioga (1) (1954-74)	130	150	170	190	200	220	230	19	19	18	18	18	18	18
Tioga River at Tioga Junction (1976-78)	140	180	220	260	260	300	350	40	56	71	84	87	100	84
Cowanesque River at Nelson (1974-77)	150	180	240	300	300	320	340	17	21	27	33	34	36	33
Cowanesque River near Lawrenceville (1974-77)	140	180	240	300	310	340	350	18	22	26	30	31	32	30
Tioga River at Lindley (1974-78)	150	180	250	290	300	310	320	32	41	60	72	74	78	72

Table 13.--Summary of pH and net alkalinity data

Site name	Period of record	pH			Net alkalinity (mg/L as $CaCO_3$)		
		maximum	minimum	median	maximum	minimum	median
Tioga River near Mansfield	May 1975-Apr. 1976, Feb. 1978	5.6	3.0	4.2	-5	-83	-28
Tioga River at Lambs Creek	Sept. 1973-Sept. 1978	6.6	3.3	4.6	2	-160	-33
Mill Creek near Tioga	Sept. 1973-Sept. 1978	9.0	6.3	8.1	81	11	49
Tioga River at Tioga[1/]	Sept. 1973-Sept. 1977	6.9	4.1	5.8	32	-69	-5
Crooked Creek at Middlebury Center	Sept. 1973-Aug. 1974, Apr. 1976-Sept. 1978	9.1	6.2	7.4	86	15	60
Crooked Creek at Tioga (1)	Sept. 1973-Mar. 1975	8.2	6.4	7.4	79	24	41
Crooked Creek at Tioga (2)	Apr. 1975-Sept. 1978	9.3	6.6	7.9	97	14	54
Tioga River at Tioga Junction	Sept. 1973-Sept. 1978	7.8	5.6	6.7	43	-2	10
Cowanesque River at Westfield	Sept. 1973-Aug. 1974	8.5	6.4	7.1	57	34	37
Mill Creek at Westfield	Sept. 1973-Aug. 1974	9.4	6.2	7.8	83	56	72
Cowanesque River at Cowanesque	Sept. 1973-Aug. 1974	8.7	6.4	7.6	89	36	72
Troups Creek at Knoxville	Sept. 1973-Aug. 1974	8.8	6.1	7.8	85	55	76
Cowanesque River at Nelson	Sept. 1973-Aug. 1974, Apr. 1976-Sept. 1977	9.3	6.4	7.8	98	28	58
Cowanesque River near Lawrenceville	Sept. 1973-Sept. 1977	9.1	6.3	7.8	94	23	48
Tioga River at Lindley	Sept. 1973-Sept. 1977	8.4	6.1	7.2	53	9	30

[1/] 1978 data were not included because of flow diverted from Crooked Creek to Tioga River at Tioga.

Acid-base titration curves (fig. 7) were developed as each measurement of alkalinity and acidity was made. These curves provide additional information about the buffering capacity of the water sample by indicating partial alkalinities and acidities between the titration endpoints of 4.5 and 8.3. On the Lambs Creek curve for August 24, 1978, the sample had an initial pH of 3.8 and a total acidity of 94 mg/L. However, to raise the pH from 3.8 to 6.0 (the value necessary to support a warm-water fishery), only 63 mg/L of the 94 mg/L of total acidity would need to be neutralized. The Tioga Junction sample for August 8, 1977, had an initial pH of 7.7, a total alkalinity of 46 mg/L, and total acidity of 3 mg/L. The amount of alkalinity available to neutralize additional acidity without reducing the pH below 6.0 is 30 mg/L.

The fastest rate of change for both the Lambs Creek (acidic) and Tioga Junction (alkaline) curves occurs near the endpoints. The Tioga Junction curve is symmetrical, whereas the Lambs Creek curve has a portion between pH 4.5 and 5.0 that is relatively flat compared to the rest of the curve. A flattened curve was observed in all but the most weakly buffered samples containing acid-mine drainage. This buffering capacity between pH 4.5 and 5.0 had to be overcome before the sample could be neutralized, and it accounts for a significant part of the total acidity of the sample.

In addition to the acid-base titration curves developed at all sites, water samples collected monthly at Crooked Creek at Tioga were titrated into Tioga River at Tioga water samples. This was done to examine the change in pH when the two waters were mixed, in anticipation of the weir construction which will mix water from the two lakes when the reservoirs are operational. These titrations show that the buffering capacities of Crooked Creek and the Tioga River (at Tioga) vary proportionately. When Tioga River was strongly buffered by acid, Crooked Creek was strongly buffered by base. Conversely, when Tioga River was weakly buffered, so was Crooked Creek.

The buffering capacity of a sample can not always be estimated from its pH (fig. 8). On August 6, 1975, Crooked Creek had a pH of only 7.4, but a sample easily raised the pH of the Tioga River sample from 4.5 to 7.0. The same volume of Crooked Creek water used April 6, 1976, when the pH was 8.1, raised the pH of the Tioga River sample from 7.0 to 7.7.

According to streamflow records, the flows of Crooked Creek at Tioga are about one-quarter of those at the Tioga River at Tioga. Using the examples plotted in figure 8 as a guide, the mixing of the two streams at normal streamflows (25 percent Crooked Creek water) generally produces a pH between 5.5 to 7.0.

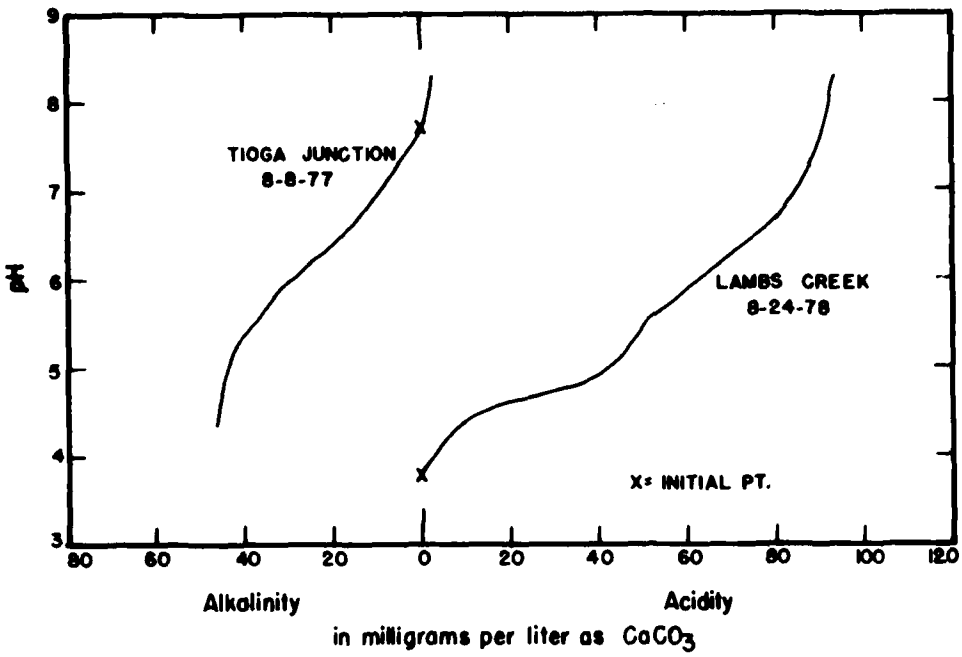


Figure 7.--Acid-base titration curves for two sites on the Tioga River.

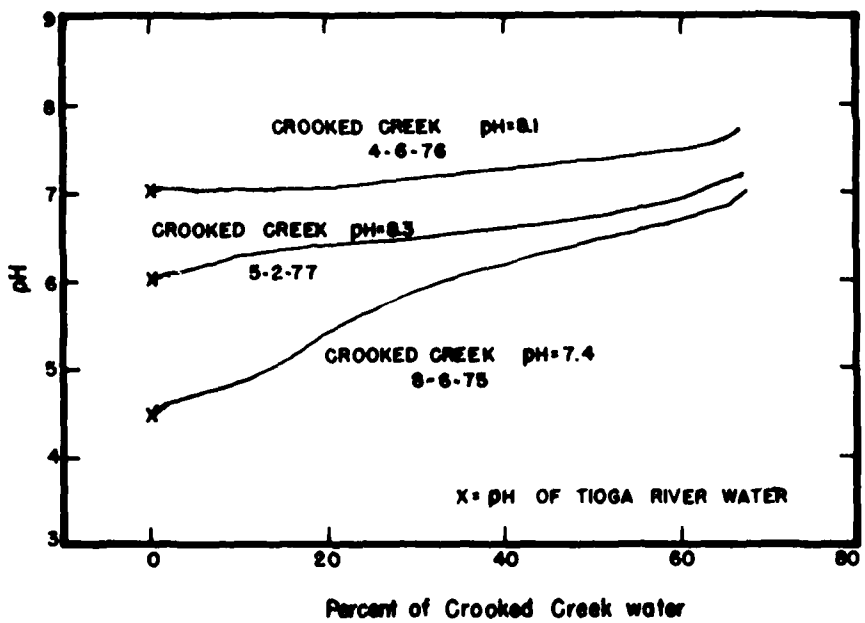


Figure 8.--Titration curve for Tioga River at Tioga with water from Crooked Creek at Tioga.

The relationship between the logarithms of net alkalinity and streamflow are shown in table 14. A constant of 100 or 200 was added to net alkalinities at sites with both positive and negative values before logarithms were taken. Net alkalinity increases (becomes less acid) with increasing streamflow at sites with normally acidic pH, and decreases (becomes less alkaline) with increasing streamflow at sites with normally alkaline pH. Standard errors of estimate are usually less than 0.10. In both situations, an increase in streamflow helps to dilute the sources of acidity or alkalinity, thus reducing the buffering capacity of the stream.

Nitrogen and Phosphorus

Samples were analyzed for ammonia nitrogen, nitrite-plus-nitrate nitrogen, organic nitrogen, total phosphorus, and orthophosphate. Tables 15 and 16 summarize dissolved and total nutrients, respectively, at each site.

Table 15 shows that nitrite-plus-nitrate contributed 55 percent of the sum of ammonia, nitrite-plus-nitrate, and organic nitrogen. Organic nitrogen comprised 40 percent of the same sum. Ammonia nitrogen was a small contributor (5 percent of the sum). The sum of organic phosphorus plus orthophosphate was composed of about equal amounts of organic phosphorus and orthophosphate except in one sample from Crooked Creek at Middlebury Center in which the orthophosphate concentration (0.48 mg/L) was considerably higher than the organic phosphorus concentration. The median nitrogen and phosphorus concentrations were generally low, but high enough to support biological activity.

The total nitrogen and phosphorus data (table 16) show the same trends as data for dissolved nitrogen and phosphorus. Maximum concentrations of total nutrients are substantially higher than those for dissolved nutrients, whereas median concentrations are only slightly higher. This is probably due to the contribution of nitrogen and phosphorus associated with sediment during high flows, but no direct correlations between the total and dissolved nutrients can be made as the two types of samples were collected at different times. Most nutrients attached to sediment particles are not readily available for biological uptake.

Logarithmic regression analyses relating discharge to nitrogen and phosphorus show that some variability in nutrient levels is due to seasonal effects. The standard errors of estimate for discharge and dissolved nutrients are about the same as those for discharge and total nutrients. Generally, both dissolved and total nitrogen and phosphorus increase with increasing discharge at all sites, probably as a result of nonpoint sources in the basin.

Table 14.--Regression coefficients for the logarithms of streamflow to net alkalinity

Site	log a	b	Standard error of estimate	Number of observations
Tioga River near Mansfield (+100)[1/]	0.94	0.38	0.11	13
Tioga River at Lambs Creek (+200)	1.92	.13	.09	51
Mill Creek near Tioga	2.17	- .34	.13	43
Tioga River at Tioga (+100)	1.73	.10	.09	43
Crooked Creek at Middlebury Center	2.12	- .29	.12	24
Crooked Creek at Tioga (1)	2.07	- .22	.12	6
Crooked Creek at Tioga (2)	2.00	- .20	.15	34
Tioga River at Tioga Junction (+100)	2.05	.00	.04	46
Cowanesque River at Westfield	2.51	-1.01	.17	3
Mill Creek at Westfield	1.97	- .21	.02	5
Cowanesque River at Cowanesque	2.38	- .43	.08	4
Troups Creek at Knoxville	2.00	- .17	.03	4
Cowanesque River at Nelson	2.32	- .26	.08	18
Cowanesque River near Lawrenceville	2.37	- .29	.09	45
Tioga River at Lindley	2.00	- .20	.15	38

[1/]Indicates the value added to the net alkalinity to compute regression coefficients for this site.

Table 15.--Summary of dissolved nitrogen and phosphorus data, September 1977 to September 1978

Site name	Ammonia nitrogen as P (mg/L)			Nitrite + nitrate nitrogen as N (mg/L)			Organic nitrogen as N (mg/L)			Organic phosphorus as P (mg/L)			Orthophosphate as P (mg/L)		
	maximum	minimum	median	maximum	minimum	median	maximum	minimum	median	maximum	minimum	median	maximum	minimum	median
Tioga River at Lambs Creek	0.17	0.01	0.08	0.54	0.34	0.45	0.25	0.00	0.15	0.04	0.00	0.00	0.02	0.00	0.00
Mill Creek near Tioga	.06	.00	.00	.77	.00	.18	.41	.00	.26	.06	.00	.01	.02	.00	.00
Tioga River at Tioga[1/]	.13	.01	.03	.69	.18	.36	.42	.12	.23	.01	.00	.00	.00	.00	.00
Crooked Creek at Middlebury Center	.07	.00	.02	.76	.01	.31	.54	.23	.34	.03	.00	.01	.48	.01	.02
Crooked Creek at Tioga (2)	.03	.00	.01	.63	.16	.51	.44	.00	.33	.06	.00	.01	.03	.00	.01
Tioga River at Tioga Junction	.08	.01	.04	.73	.23	.31	.51	.00	.22	.06	.00	.00	.00	.00	.00

[1/]Data for this site are influenced by the diversion of Crooked Creek water to the Tioga River at Tioga.

Table 16.--Summary of total nitrogen and phosphorus data

Site name	Period of record	Ammonia nitrogen as N (mg/L)			Nitrite + nitrate nitrogen as N (mg/L)			Organic nitrogen as N (mg/L)			Organic phosphorus as P (mg/L)			Orthophosphate as P (mg/L)		
		maximum	minimum	median	maximum	minimum	median	maximum	minimum	median	maximum	minimum	median	maximum	minimum	median
Tioga River near near Mansfield	May 1975-Mar. 1976	0.07	0.01	0.04	0.72	0.20	0.37	0.43	0.06	0.10	0.21	0.00	0.02	0.05	0.00	0.01
Tioga River at Lambs Creek	Sept. 1973-June 1977	.41	.00	.09	1.60	.18	.52	.56	.05	.16	.18	.00	.02	.11	.00	.02
Mill Creek near Tioga	Sept. 1973-June 1977	.09	.00	.02	1.10	.00	.36	.46	.12	.20	.07	.00	.01	.04	.00	.01
Tioga River at Tioga[1/]	Sept. 1973-June 1977	.29	.00	.08	1.10	.16	.48	.69	.05	.18	.14	.00	.01	.06	.00	.01
Crooked Creek at Middlebury Center	Sept. 1973-Aug. 1974, June 1975-June 1977	.22	.01	.07	1.20	.04	.35	.50	.12	.22	.05	.00	.02	.35	.01	.02
Crooked Creek at Tioga (1)	Sept. 1973-Mar. 1975	.12	.05	.09	.79	.02	.32	.66	.16	.24	.10	.00	.03	.11	.00	.03
Crooked Creek at Tioga (2)	Apr. 1975-June 1977	.07	.00	.02	.84	.05	.29	.60	.11	.31	.17	.00	.04	.13	.01	.04
Tioga River at Tioga Junction	Sept. 1973-June 1977	.24	.01	.06	1.50	.16	.40	1.30	.00	.20	.18	.00	.02	.33	.00	.02
Cowanesque River at Westfield	Sept. 1973-Aug. 1974	.21	.03	.06	1.00	.05	.44	.36	.18	.21	.02	.00	.01	.04	.00	.01
Mill Creek at Westfield	Sept. 1973-Aug. 1974	.27	.03	.17	1.00	.09	.62	.48	.25	.38	.09	.00	.02	.18	.02	.06
Cowanesque River at at Cowanesque	Sept. 1973-Aug. 1974	.59	.02	.21	1.00	.10	.48	.81	.19	.47	.10	.01	.02	.08	.00	.03
Troups Creek at Knoxville	Sept. 1973-Aug. 1974	.14	.02	.06	1.80	.20	.78	.68	.19	.30	.07	.00	.01	.05	.00	.01
Cowanesque River at Nelson	Sept. 1973-Aug. 1974, June 1975-June 1977	.31	.00	.09	1.90	.02	.61	.89	.20	.37	.15	.00	.02	.08	.01	.03
Cowanesque near Lawrenceville	Sept. 1973-June 1977	.27	.00	.06	1.20	.01	.59	.78	.16	.32	.13	.00	.02	.10	.00	.02
Tioga River at Lindley	Sept. 1973-June 1977	.21	.01	.06	1.20	.08	.48	.61	.10	.23	.13	.00	.02	.07	.00	.02

[1/] Data from 1978 water year were not included because of diversion of Crooked Creek water to Tioga River at Tioga.

Trace Elements

Collection of stream samples for the analysis of dissolved and total trace elements began in May 1974 (tables 17 to 19). Cobalt, copper, and lead (tables 17 and 18) were present in the highest concentrations. The maximum total concentrations of these metals may be deleterious to aquatic life, but the median values are within acceptable limits (Moran and Wentz, 1974).

Table 19 summarizes the aluminum, iron, manganese, and zinc data. These metals, commonly associated with acid-mine drainage, generally occur in high concentrations almost always in excess of that needed for the support of aquatic life. Iron and aluminum precipitates coat the Tioga River streambed from Blossburg to below Tioga Junction. The metal concentrations generally decrease downstream from the mines. Water from alkaline tributaries dilutes metal concentrations in the Tioga River and also raises the pH, which facilitates the precipitation of iron and aluminum. The data collected from Mill Creek and Crooked Creek are probably representative of background levels as these streams are not affected by acid-mine drainage or large industrial effluents.

The relations of aluminum, iron, manganese, and zinc to streamflow in the Tioga River were examined by regression analyses (eq. 1). The analyses (table 20) show that streamflow and manganese produced regression equations with the lowest standard errors. The relations of zinc and iron to streamflow have the next lowest standard errors; aluminum is not closely related to streamflow.

Because manganese and zinc precipitate at a pH much higher than normally observed at the Tioga River sites, dilution has a more significant influence on concentration than does precipitation. Thus, these metals are more closely related to streamflow than are iron and aluminum, which are significantly influenced by pH.

In the upper reaches of the Tioga River, dissolved and total aluminum, manganese, and zinc concentrations decrease as streamflow increases. Dissolved iron also decreases, but total iron increases. The metal concentrations decrease as high flows dilute the acid-mine drainage entering the Tioga River. Total iron probably increases because the iron that has precipitated and coated the stream bottom in this reach is scoured and transported downstream during periods of high flow.

Table 17.--Summary of dissolved trace-element data, March to July 1975

Site name	Arsenic (µg/L)			Cadmium (µg/L)			Chromium (µg/L)			Cobalt (µg/L)			Copper (µg/L)			Lead (µg/L)		
	maximum	minimum	median	maximum	minimum	median	maximum	minimum	median	maximum	minimum	median	maximum	minimum	median	maximum	minimum	median
Tioga River at Lambs Creek	1	0	0	1	0	0	10	0	0	54	16	29	20	10	10	7	0	2
Tioga River at Tioga	1	0	0	1	0	0	10	0	0	36	9	23	10	0	10	1	0	0
Tioga River at Tioga Junction	2	0	0	1	0	0	10	0	10	18	6	12	10	0	0	1	0	1
Tioga River at Lindley	1	0	0	0	0	0	10	0	0	13	4	6	10	0	10	2	0	1

Site name	Mercury (µg/L)			Selenium (µg/L)			Silver (µg/L)		
	maximum	minimum	median	maximum	minimum	median	maximum	minimum	median
Tioga River at Lambs Creek	.5	.5	.5	1	0	1	0	0	0
Tioga River at Tioga	.5	.5	.5	1	0	1	0	0	0
Tioga River at Tioga Junction	1.3	.5	.5	1	0	0	0	0	0
Tioga River at Lindley	.5	.5	.5	1	0	0	0	0	0

Table 18.--Summary of total trace-element data, May 1974 to February 1975

Site name	Arsenic (µg/L)			Cadmium (µg/L)			Chromium (µg/L)			Cobalt (µg/L)			Copper (µg/L)			Lead (µg/L)		
	maximum	minimum	median	maximum	minimum	median	maximum	minimum	median	maximum	minimum	median	maximum	minimum	median	maximum	minimum	median
Tioga River at Lambs Creek	3	0	1	2	0	1	10	0	0	140	10	50	50	0	30	7	2	4
Tioga River at Tioga	2	0	1	3	0	0	10	0	0	120	3	28	50	0	20	5	0	2
Tioga River at Tioga Junction	3	0	1	1	0	0	10	0	0	75	8	18	20	0	10	14	0	2
Tioga River at Lindley	2	0	1	1	0	0	10	0	0	38	5	11	20	0	10	14	0	1

Site name	Mercury (µg/L)			Selenium (µg/L)			Silver (µg/L)		
	maximum	minimum	median	maximum	minimum	median	maximum	minimum	median
Tioga River at Lambs Creek	0.8	0.5	0.5	3	0	1	1	0	0
Tioga River at Tioga	.5	.5	.5	2	0	1	0	0	0
Tioga River at Tioga Junction	.5	.5	.5	2	0	0	1	0	0
Tioga River at Lindley	.5	.5	.5	2	0	0	0	0	0

Table 19.--Summary of aluminum, iron, manganese, and zinc data

Site name	Period of record	Total Metals (µg/L)											
		Aluminum			Iron			Manganese			Zinc		
		maximum	minimum	median	maximum	minimum	median	maximum	minimum	median	maximum	minimum	median
Tioga River at Lambs Creek	May 1974-Feb. 1975	12,000	20	2,900	3,400	500	1,500	8,400	610	2,900	1,300	90	480
Tioga River at Tioga	May 1974-Feb. 1975	7,400	10	2,400	2,600	150	760	5,900	450	2,000	3,100	60	500
Tioga River at Tioga Junction	May 1974-Feb. 1975	2,600	0	1,200	4,500	20	700	5,700	470	1,200	580	60	120
Tioga River at Lindley	May 1974-Dec. 1975	2,600	0	540	4,700	0	650	2,300	260	830	310	40	100

Site name	Period of record	Dissolved Metals (µg/L)											
		Aluminum			Iron			Manganese			Zinc		
		maximum	minimum	median	maximum	minimum	median	maximum	minimum	median	maximum	minimum	median
Tioga River near Mansfield	May-Dec. 1975, Feb. 1978	9,200	810	3,800	1,200	100	550	7,300	1,500	3,900	1,100	200	610
Tioga River at Lambs Creek	Mar.-Nov. 1975, Oct. 1977-Sept. 1978	8,500	40	3,300	1,700	50	360	8,100	710	3,600	1,700	60	420
Mill Creek near Tioga	Oct. 1977-Sept. 1978	220	20	40	420	0	20	40	0	20	70	0	10
Tioga River at Tioga[1/]	Mar.-Nov. 1975, Oct. 1977-Sept. 1978	4,000	30	60	470	10	80	5,100	810	1,600	620	70	260
Crooked Creek at Middlebury Center	Oct. 1977-Sept. 1978	50	10	30	110	10	40	100	20	40	30	0	10
Crooked Creek at Tioga (2)	Oct. 1977-Sept. 1978	70	20	30	100	0	10	40	0	20	10	0	10
Tioga River at Tioga Junction	Mar.-Dec. 1975, Oct. 1977-Sept. 1978	170	20	60	280	0	40	3,200	360	1,400	260	20	180
Tioga River at Lindley	Mar. 1975-Dec. 1975	120	10	30	310	20	60	1,400	250	580	90	10	50

[1/] 1978 data were not included because of the diversion of Crooked Creek to Tioga River at Tioga.

Table 20.--Regression coefficients for the logarithms of streamflow to aluminum, iron, manganese, and zinc

Site name		log a	b	Standard error	Number of observations
Tioga River near Mansfield					
x	y				
streamflow	dissolved aluminum	6.09	-1.31	0.41	9
	dissolved iron	3.69	- .56	.38	9
	dissolved manganese	4.79	- .62	.13	9
	dissolved zinc	4.11	- .70	.15	9
Tioga River at Lambs Creek					
x	y				
streamflow	dissolved aluminum	5.47	-1.03	.53	16
	total aluminum	3.95	- .35	.84	10
	dissolved iron	2.64	- .08	.35	16
	total iron	2.48	.35	.16	10
	dissolved manganese	4.60	- .51	.15	16
	total manganese	4.67	- .58	.12	10
	dissolved zinc	4.19	- .71	.16	16
	total zinc	3.85	- .57	.15	10
Tioga River at Tioga					
x	y				
streamflow	dissolved aluminum	4.55	- .99	.71	9
	total aluminum	3.87	- .30	.86	10
	dissolved iron	2.26	- .14	.50	9
	total iron	1.55	.61	.18	10
	dissolved manganese	4.63	- .58	.15	9
	total manganese	4.62	- .58	.16	10
	dissolved zinc	4.05	- .72	.18	9
	total zinc	4.11	- .71	.28	10
Tioga River at Tioga Junction					
x	y				
streamflow	dissolved aluminum	1.97	- .10	.28	18
	total aluminum	1.24	.66	.45	8
	dissolved iron	-1.03	.98	.47	18
	total iron	- .48	1.27	.41	9
	dissolved manganese	3.96	- .34	.24	18
	total manganese	4.30	- .48	.20	9
	dissolved zinc	3.54	- .57	.29	18
	total zinc	3.39	- .50	.19	9
Tioga River at Lindley					
x	y				
streamflow	dissolved aluminum	1.94	- .12	.35	10
	total aluminum	.37	.84	.71	15
	dissolved iron	.48	.48	.40	10
	total iron	- .32	1.17	.70	15
	dissolved manganese	3.76	- .36	.20	10
	total manganese	3.98	- .43	.19	15
	dissolved zinc	1.98	- .12	.32	10
	total zinc	2.74	- .30	.24	15

In the lower Tioga River, at Tioga Junction and Lindley, however, concentrations of total aluminum and dissolved and total iron increase, whereas the other metals decrease with increasing streamflow. Again, total aluminum and iron increase with increasing streamflow because their precipitates are transported during high flow. There is more aluminum precipitate in this reach of the Tioga River because the median pH (6.7) at Tioga Junction is high enough to cause precipitation; upstream from Tioga Junction the pH is generally too low for precipitation to occur. The dissolved-iron concentrations in this reach are low compared to those upstream, and the reason dissolved iron increases with streamflow is not clear. Perhaps the shortened time of travel during high flow is not conducive to precipitation.

Diel Measurements

Diel water temperature, pH, specific conductance, and dissolved oxygen measurements were made at selected sites. The measurements, lasting from 1 to 5 days each, were made every 30 minutes with a NERA 4 water-quality monitor (fig. 9). Hourly data collected at each site are summarized in table 23.

Examples of observed fluctuations in water temperature, pH, specific conductance, and dissolved oxygen are shown in figures 10 and 11. The figures show the differences in diel fluctuations in two different water-temperature ranges at Tioga River at Lambs Creek and Mill Creek near Tioga.

Streamflow was constant or slowly decreasing for measurements made at both temperature ranges at Tioga River at Lambs Creek. The weather was clear and sunny as evidenced by the sharp rise in water temperature, which peaked at about 1700 each day (fig. 10). Water temperatures ranged from 7° to 14°C on April 29, 1976, and from 16° to 20°C on September 16, 1978.

The differences in water temperature for the two dates affected the concentration of dissolved oxygen in the water. In April, dissolved-oxygen levels were higher than in September, because the water was cooler and could hold more oxygen before reaching saturation. The concentrations of dissolved oxygen at 100 percent saturation are plotted in figure 10.

The fluctuations in dissolved oxygen on April 29 were caused by changes in water temperatures, as the percentage saturation was nearly constant. On September 16, however, dissolved oxygen was supersaturated from about 0900 to 1800. This supersaturation probably resulted from biological activity of algae and phytoplankton in the stream during the daylight hours.

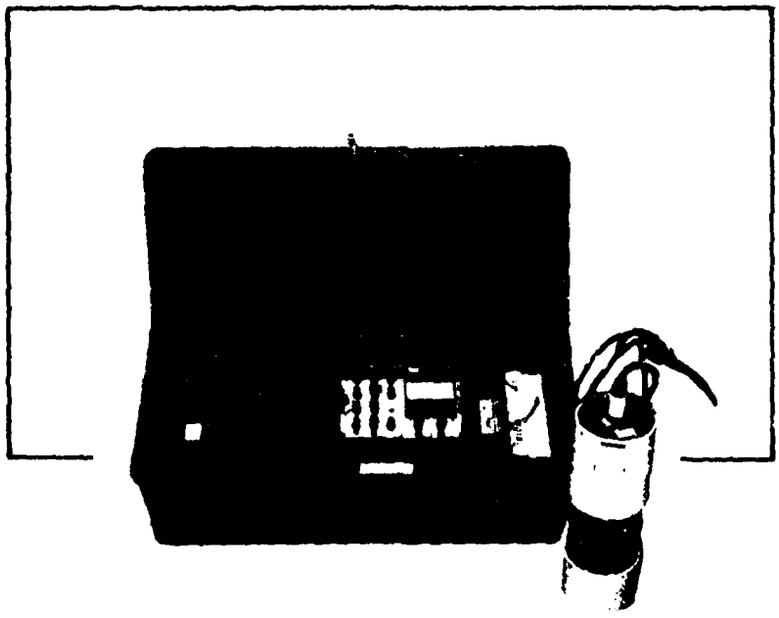


Figure 9.--NERA 4 water-quality monitor.

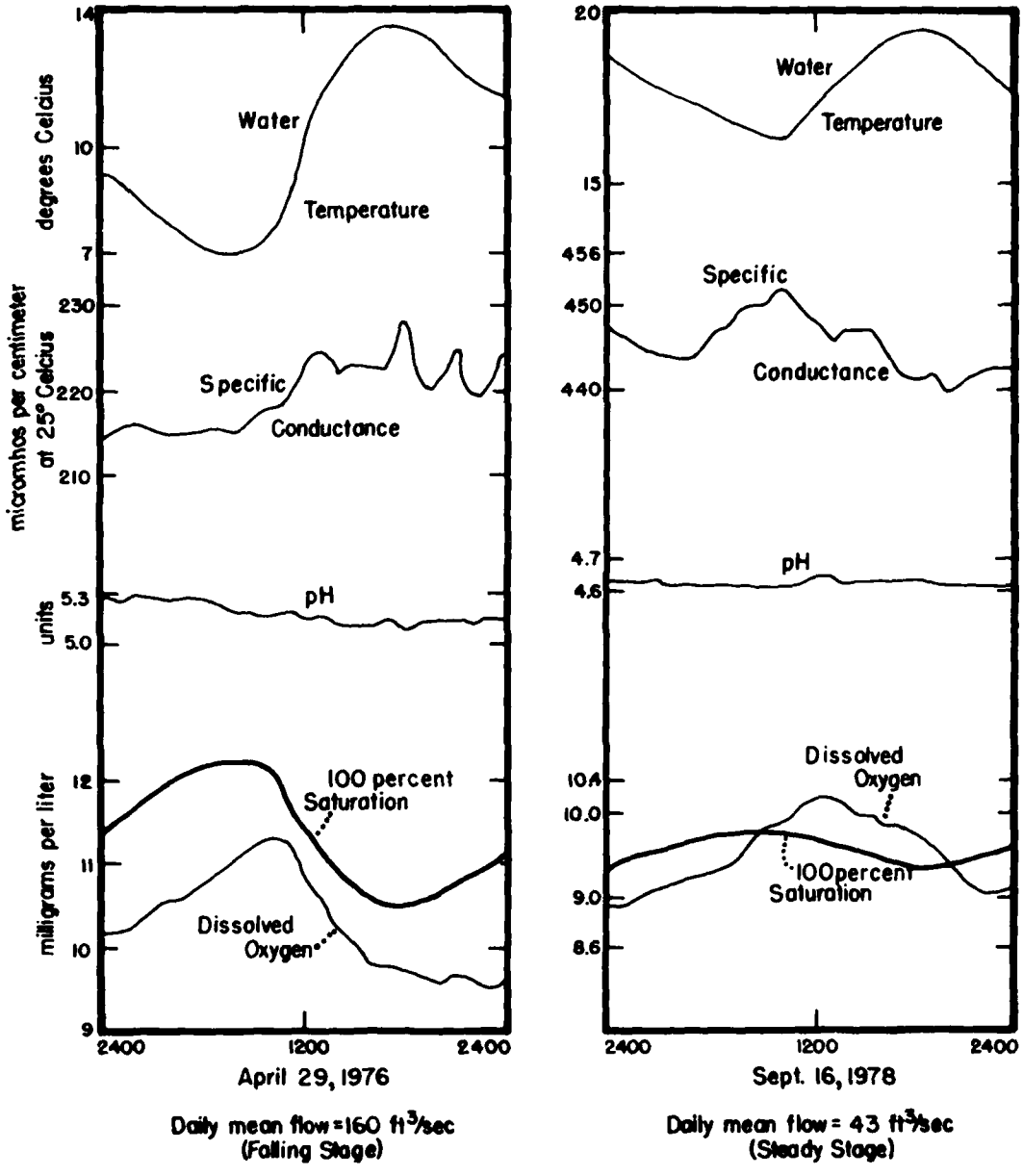


Figure 10.--Diel measurements of water temperature, specific conductance, pH, and dissolved oxygen at Tioga River at Lambs Creek.

Biological activity generally affects both the dissolved-oxygen concentration and the pH of a stream. Photosynthesis during the day shifts the carbonate equilibrium and raises the pH of a stream as well as the dissolved-oxygen concentration. In a well-buffered system, however, the effects of biological activity on the carbonate equilibrium may be masked and there will be little or no resultant pH change. Consequently, the best determinant of biological activity is an increase in dissolved-oxygen concentration. On September 16, there was more biological activity than on April 29, as reflected in the large changes in dissolved-oxygen concentrations, but little change in pH because of strong buffering.

The specific conductance changed less than 10 percent during April 29 and September 16. The changes observed were probably related to changes in streamflow, not photosynthesis and respiration. The twofold increase in conductance between the April and September measurements was caused by lower streamflow and related higher concentrations of dissolved solids in September.

Water temperature at Mill Creek near Tioga (fig. 11) changed from 8° to 13°C on April 12, 1978, and from 12° to 21°C on June 14, 1978, peaking at 1600 on both dates. Weather during both of these periods was clear and sunny, but streamflow on April 12 was high from a previous storm; streamflow June 14 was decreasing gradually. The changes in water temperature affected dissolved-oxygen levels at Mill Creek. Dissolved-oxygen levels exceeded saturation during the day on both April 12 and June 14, indicating that there was biological activity in the stream. The increased dissolved oxygen during the day is probably due to photosynthesis, and decreased dissolved oxygen during the night is probably due to respiration. The June 14 dissolved-oxygen levels increased more than those on April 12. Water temperatures were higher and the diel change was greater on June 14, indicating more sunlight than on April 12. The combination of dissolved-oxygen levels and water temperature changes is indicative of more photosynthesis activity on June 14 than on April 12.

The pH changed diurnally during both the April 12 and June 14 measurements. The peaks in pH correspond roughly to peaks in water temperature and were probably a result of carbonate equilibrium shifts due to photosynthesis and respiration; dissolved-oxygen peaks occurred about 6 hours earlier.

Specific conductance during these two dates changed less than 10 percent, and was basically influenced by streamflow. The small differences recorded seem to be inversely related to water temperatures as the minimums occur simultaneously with the water temperature maximums.

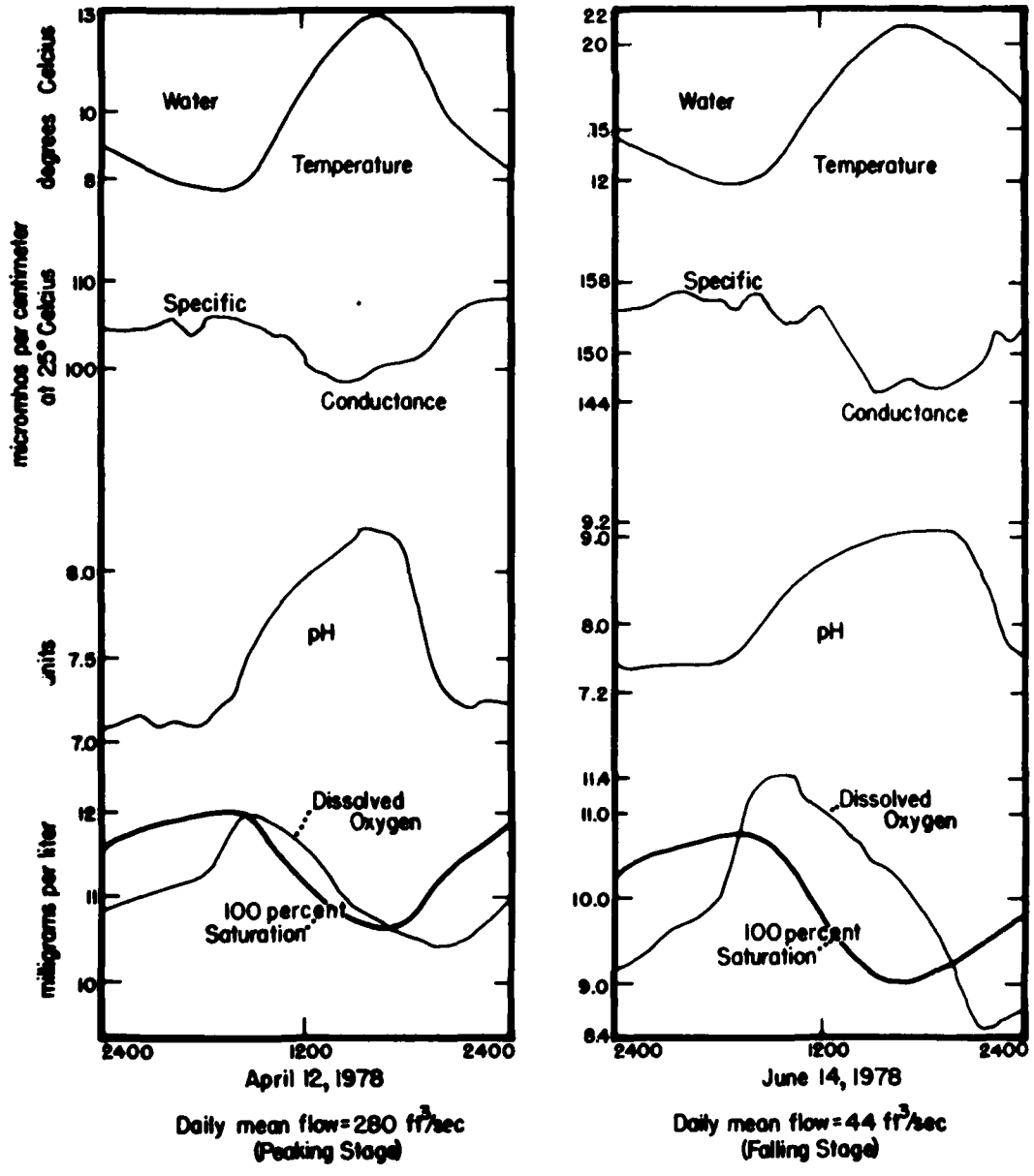


Figure 11.--Diel measurements of water temperature, specific conductance, pH, and dissolved oxygen at Mill Creek near Tioga.

Diel measurements were also made at Crooked Creek at Middlebury Center and Cowanesque River at Nelson. Observations at these two sites were similar to those observed at Mill Creek near Tioga.

Biological Data

Coliform bacteria and phytoplankton data, collected at several sites, are summarized in table 21. Acid-mine drainage probably reduces the survival of fecal coliforms, which is reflected in the low counts at the Tioga River sites. The ratios of fecal coliform bacteria to fecal streptococci are all less than one. Fecal contamination may be predominantly from animal (nonhuman) sources (Geldreich and Kenna, 1969). Care in interpreting these ratios is necessary because they can be easily altered by die-off and because the fecal coliform counts are low. The bacteria counts could increase and the ratio of fecal coliform bacteria to fecal streptococci could change if mine drainage is neutralized without additional sources of contamination.

Table 21 shows that Tioga River at Lambs Creek and Crooked Creek at Middlebury Center had the highest phytoplankton counts. The counts probably include fragments of periphyton which had broken away from natural substrates, and may be limited by the velocity of the stream rather than its nutrient content.

Table 22 summarizes the dominant (greater than 15 percent of the sample) phytoplankton and the percent composition of each sample collected in 1978. The phytoplankton found in Tioga River at Lambs Creek samples were mostly blue-green algae during summer, and pennate diatoms in May and June. The Tioga River at Tioga supported a slightly more diverse population, which included pennate diatoms present throughout the season, blue-green algae from May to August, and green algae in September. Tioga River at Tioga Junction contained pennate diatoms from May to August, blue-green algae in March, green algae in May and August, and centric diatoms in May. There were no phytoplankton in the September sample at Tioga Junction. Mill Creek contained pennate diatoms through the season and blue-green algae in June and September, green algae in July and September, and centric diatoms in July.

Crooked Creek at Tioga (2) had a mixture of pennate diatoms, green algae, and blue-green algae through the season. This site was affected by the diversion of water into the Tioga River above Tioga, which severely limited the amount and velocities of waters in the stream. The diversion of water and increased water temperatures probably affected the phytoplankton results at Crooked Creek at Tioga (2). Before water was diverted from Crooked Creek, phytoplankton at Crooked Creek at Tioga (2) was probably more closely related to that upstream at Middlebury Center. Crooked Creek at Middlebury Center contained pennate diatoms through the season, and green algae and euglenoids in July. No other site contained euglenoids that were dominant.

Table 21.--Summary of coliform bacteria and phytoplankton data collected during 1978

Site name	Fecal coliform bacteria (colonies/100 mL)			Fecal streptococci (colonies/100 mL)			Total phytoplankton (cells/mL)	
	maximum	minimum	median	maximum	minimum	median	maximum	minimum
Tioga River at Lambs Creek	2[1]	<1[1]	<1[1]	190	<1[1]	5[1]	10,000	110
Mill Creek near Tioga	270	4[1]	60	840	19[1]	120	1,200	82
Tioga River at Tioga	170	<1	<1	200	<1[1]	11[1]	2,300	82
Crooked Creek at Middlebury Center	180	7[1]	81	5,900	86	210	7,800	68
Crooked Creek at Tioga (2)	53	2[1]	6[1]	310	50	120	2,400	42
Tioga River at Tioga Junction	110	<1[1]	4[1]	740	12[1]	40	4,100	0

[1]Based on counts outside the acceptable range.

Table 22.--Summary of dominant phytoplankton and the percent composition of each sample, in parentheses, collected in 1978

Site name	March 24	May 25	June 28	July 25	August 24	September 27
Tioga River at Lambs Creek	BG (58)	PD (100)	PD (43) BG (55)	BG (84)	BG (94)	BG (88)
Mill Creek near Tioga	PD (100)	PD (89)	PD (71) BG (20)	G (57) CD (25)	PD (94)	G (54) PD (26) BG (20)
Tioga River at Tioga	PD (100)	PD (44) BG (17)	PD (65) BG (27)	PD (31) BG (47)	BG (89)	G (20) PD (70)
Crooked Creek at Middlebury Center	PD (100)	PD (95)	PD (93)	G (59) E (27)	PD (77)	PD (100)
Crooked Creek at Tioga (2)	CD (33) PD (67)	PD (95)	G (39) BG (24)	G (32) PD (43)	GB (51)	G (53) PD (47)
Tioga River at Tioga Juntion	BG (89)	G (50) CD (20) PD (30)	PD (95)	PD (82)	G (18) PD (82)	---

G - Green algae
BG - Blue-green algae
CD - Centric diatoms
PD - Pennate diatons
E - Euglenoids

Figure 12 shows the changes in diversity indices (by genus) through the summer. Also listed for comparison are the total counts for each sample. The highest count, at Tioga River at Lambs Creek, coincided with the lowest diversity index for that site and was dominated by blue-green algae. Blue-green algae are commonly dominant during warm water temperatures in the fall. Generally, a high count with a decreased diversity index indicates a preferential bloom of a particular class and should not be interpreted as indicating a healthy population. Populations with a diversity index of less than three are considered to be under some type of chemical or physical stress. Only the two Crooked Creek sites had diversity indices of three or more. The diversion of water into the Tioga River at Tioga caused lower velocities and higher water temperatures in Crooked Creek at Tioga (2) than would have been expected. This may indicate that there will be some change in the diversity indices of the lakes than is now observed in the streams.

Algal growth-potential (AGP) samples were collected at Tioga River at Lambs Creek, Mill Creek near Tioga, Crooked Creek at Middlebury Center, and Cowanesque River at Nelson in April and May 1976. The AGP assay is designed to measure the maximum potential for algal growth by introducing Selenastrum capricornutum to a sample of water and measuring its growth rate under standardized laboratory conditions. The results were all extremely low, less than 1.2 mg/L, probably because S. capricornutum is very sensitive to zinc and is not native to this area. After two sets of samples were tested, the analysis was discontinued. The absence of growth of S. capricornutum, however, does not indicate that other species of algae will not grow in the Tioga River basin and the three reservoirs; nor does it mean that there will not be excessive growth of specific algal species, as evidenced by high counts of blue-green algae at Tioga River at Lambs Creek.

IMPOUNDMENTS AND THEIR EFFECTS ON EXISTING WATER QUALITY

The water quality and streamflow characteristics of the inflows to the three reservoirs under construction were measured at Tioga River at Lambs Creek and Mill Creek near Tioga for Tioga Lake; Crooked Creek at Middlebury Center for Hammond Lake; and Cowanesque River at Nelson for Cowanesque Lake. Regression coefficients given in this report may be used to compute probable chemical concentrations based on streamflow at these sites. Any changes upstream from these as changes in land use, enhanced recreational activity, or the treatment of acid-mine discharges above Mansfield would affect the quality of water entering the reservoirs and change the regression coefficients given here.

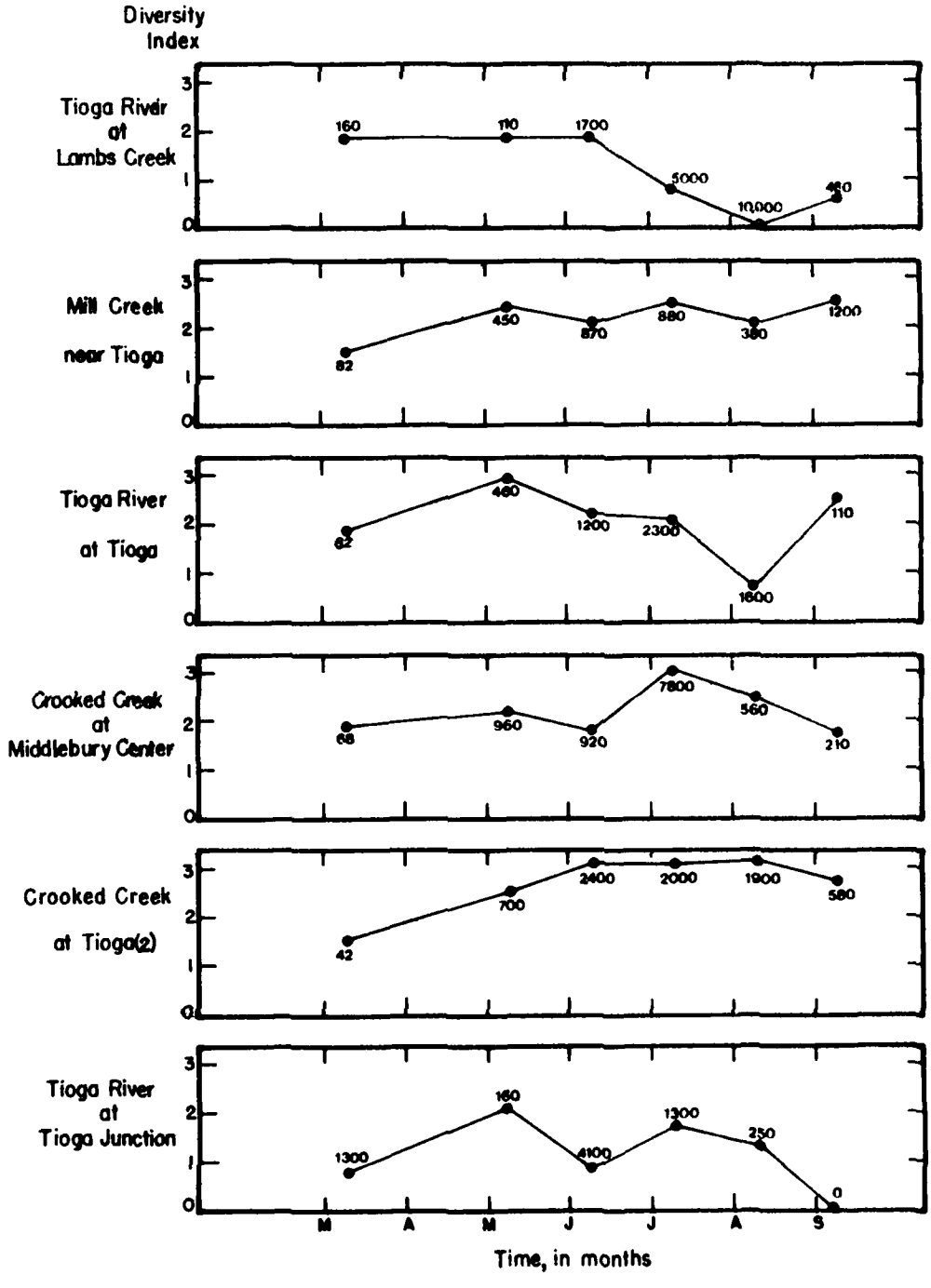


Figure 12.--Diversity index (by genus) and total counts of phytoplankton sampled in 1978.

The rates of sediment deposition in the planned lakes can be estimated by utilizing the following assumptions: (1) the 3 years of sediment record at Tioga River at Lindley are representative of the long-term average; (2) sediment yields at Tioga River at Lindley represent sediment yields in the basin above the lakes; and (3) the trap efficiencies of the lakes, based on capacity-inflow ratios calculated by Brune (1953) are about 80 percent. Accordingly, deposition rates in Tioga, Hammond, and Cowanesque Lakes will be 120, 50, and 130 acre-feet per year, based on a specific weight of about 60 lb/ft^3 of deposited sediment. Much of this deposition will probably be concentrated in the shallow inflow areas of the lakes.

A part of Mill Creek near Tioga will be impounded by Tioga Lake, and this section of the Tioga Lake will probably be more eutrophic than the rest of the lake. Tioga Lake will probably stratify chemically and thermally during the summer, allowing high concentrations of heavy metals to accumulate in the lower levels of the lake. Dissolved-oxygen levels in the hypolimnion will be significantly lower than in the epilimnion due to the oxidation of these metals. Lower-level outlets from Tioga Dam should not be used during these periods of stratification to prevent degradation of water quality in the Tioga River below Tioga Dam. The epilimnion of Tioga Lake near the weir will contain a mixture of water from Tioga and Hammond Lakes that will extend down to the outlet of Tioga Dam. This section of Tioga Lake will experience periodic changes in water quality, depending on the control of the weir discharge and its lateral and vertical mixing with Tioga Lake water.

The epilimnion of Tioga Lake will probably be saturated with oxygen and support some algal activity, but it will be limited by phosphorus availability. The lake may be somewhat acid, with more acidity near the inflow than in the main body of the lake. The Mill Creek arm of Tioga Lake and Tioga Lake near the dam will probably maintain pH levels of 6 or more. Phytoplankton will probably be mainly centric and pennate diatoms, green algae, and blue-green algae.

Hammond Lake will be essentially alkaline and have relatively uniform water quality. It will be thermally stratified and will probably support a substantial warm-water fishery. The lake may be affected periodically during high flows by inflow from Tioga Lake through the weir, but the inflow, which comes from the epilimnion of Tioga Lake, will contain significantly less acidity and lower concentrations of heavy metals than the main body of Tioga Lake.

Crooked Creek below the Hammond Dam near Tioga will have regulated flows greatly reduced from those measured previously, as the majority of Hammond Lake water will be released into Tioga Lake. Therefore, this part of Crooked Creek will be shallow, will have a higher water temperature, and will probably have increased algal growth from that measured. Nutrient levels and specific conductance may decrease in Crooked Creek below the dam if the lake acts as a sink for nutrients. Dissolved-oxygen levels may fluctuate more widely than at present because of lowered initial dissolved-oxygen levels below the dam and increased algal activity in the streams. Unregulated flows entering Crooked Creek from the emergency spillway may disturb the balance of biological activity downstream by scouring the channel. However, these emergency flows will be of short duration.

The water quality of Tioga River at Tioga, downstream from Tioga Dam, will probably improve. During 1978, while flow from Crooked Creek was diverted to the Tioga River during construction of the reservoirs, water quality at Tioga improved to a level that had been previously observed only as far upstream as Tioga Junction. The water quality of the Tioga River below Tioga Dam should have concentrations of heavy metals similar to present levels at Tioga Junction. Operation of the multilevel withdrawal system for Tioga Lake can be done in such a way as to support a warm-water fishery in the Tioga River below Tioga Lake. Releases from the lower levels of Tioga Lake during stratification would be deleterious to both the fish and benthos in the reach between Tioga and Lawrenceville because of low dissolved-oxygen, low pH, and high metal concentrations.

Cowanesque Lake will be an alkaline, thermally stratified reservoir, similar in quality to Hammond Lake. The large reserves of alkalinity in water of Cowanesque Lake can be used in emergencies to neutralize acid loads in the Tioga River and limit any degradation of water quality in the Tioga River to the reach above Lawrenceville. The flow of the Cowanesque River below the dam will be governed by releases from the lake, and the quality should be at least as good as it is presently.

Tioga River at Lindley, the downstream limit of the study, will show the effects, in both flow and quality, of the management of all three reservoirs upstream. The quality at Lindley during the study was adequate for maintenance of a warm-water fishery, and flows can be regulated so as to maintain or improve existing quality. Extended periods of low-flow during which acid-mine drainage degrades water quality in the Tioga River downstream as far as Lindley could be eliminated by controlled releases from the reservoirs.

SUMMARY

A study of the water quality in the Tioga River basin was made from September 1973 to September 1978 to provide data to the Corps of Engineers for use in planning the operation of three reservoirs under construction in 1978. The preimpoundment water quality of the Tioga River and its major tributaries was examined, and characteristics of the reservoirs and their effects on downstream water quality are postulated.

Annual suspended-sediment yields averaged 575 tons per square mile above the downstream limit of the study. Percentages of sand, silt, and clay carried during storms were 8, 49, and 42 percent, respectively. Mill Creek near Tioga and the Cowanesque River upstream from Nelson were the smallest contributors of suspended sediment. Some sites on the Tioga River and Crooked Creek were periodically affected by construction associated with the reservoirs.

Acid-mine drainage enters the Tioga River above Blossburg, degrading water quality by increasing levels of sulfate, trace elements, and specific conductance, and decreasing alkalinity and pH. Mill Creek (near Tioga) and Crooked Creek are alkaline tributaries which help to neutralize acid-mine drainage in the Tioga River. The Cowanesque River is also alkaline, but is slightly affected by industrial effluents near Westfield, and has high chloride levels. Nutrient levels in the basin are generally low, but high enough to support biological activity. Concentrations of many of the water-quality constituents were related to discharge using regression techniques.

Diel measurements of water temperature, specific conductance, pH, and dissolved oxygen made at selected sites during different seasons indicate that mine drainage has repressed biological activity in the Tioga River. Low pH has also greatly reduced the survival of coliform bacteria. The ratio of fecal coliform bacteria to fecal streptococci indicates that fecal contamination is predominantly from animal sources. The dominant types of phytoplankton were blue-green algae, pennate diatoms, and green algae. Most of the phytoplankton samples have low diversity indices. Algal growth-potential analyses using Selanastrum capricornutum produced low counts.

Tioga Lake will be acidic and probably stratify chemically and thermally during the summer, allowing high concentrations of heavy metals to accumulate in the lower levels of the lake. Dissolved-oxygen concentrations near the bottom will be significantly lower than in the upper levels due to oxidation of the metals. Tioga Lake will probably experience periodic changes in water quality near the weir which joins it to Hammond Lake, depending on the control of the weir discharge and the lateral and vertical mixing of the weir discharge with Tioga Lake water.

Hammond and Cowanesque Lakes will be alkaline and thermally stratified. They will probably support a warm-water fishery.

The water quality of the Tioga River below the Tioga Dam will probably improve due to the addition of Hammond Lake water to the outflow from Tioga Lake. Releases from the multilevel withdrawal system will allow the water quality of the river to stabilize, and the Tioga River will not be subject to the extreme low-flow conditions that have historically damaged aquatic life.

REFERENCES

Barker, J. L., 1972, Effects of acid mine drainage on fish and macroinvertebrates of the Tioga River, Pennsylvania and New York: U.S. Geological Survey Open-File Report, 17 p.

Brown, Eugene, Skougstad, M. W., and Fishman, M. J., 1970, Methods for collection and analysis of water samples for dissolved minerals and gases: Book 5, Chapter A1: U.S. Geological Survey Techniques of Water-Resources Investigations, 160 p.

Brune, G. M., 1953, Trap efficiency of reservoirs: American Geophysical Union Transactions, v. 34, no. 3, p. 407-418.

Buchanan, T. J., and Somers, W. P., 1976, Discharge measurements at gaging stations: U.S. Geological Survey Techniques of Water-Resources Investigations, Book 3, Chapter A8, 65 p.

Geldreich, E. E., and Kenna, B. A., 1969, Concepts of fecal streptococci in stream pollution: Journal of Water Pollution Control Federation, v. 41, no. 8, part 2, p. 336-352.

Greeson, P. E., Ehlke, T. A., Irwin, G. A., Lium, B. W., Slack, K. V., eds., 1977, Methods for collection and analyses of aquatic biological and microbiological samples: Book 5, Chapter A4, U.S. Geological Survey Techniques of Water-Resources Investigations, 332 p.

Guy, H. P., and Norman, V. W., 1970, Field methods for measurement of fluvial sediment: Book 3, Chapter C2, U.S. Geological Survey Techniques of Water-Resources Investigations, 59 p.

Moran, R. E., and Wentz, D. A., 1974, Effects of metal-mine drainage on water quality in selected areas of Colorado, 1972-73: Colorado Resources Circ. no. 25, 38 p.

Rhodes, R. L., and Davis, R. S., 1968, Mine drainage in the Susquehanna River basin: Federal Water Pollution Control Administration, Middle Atlantic Region, p. 55-58.

Skougstad, M. W., Fishman, M. J., Friedman, L. C., Erdmann, D. E., and Duncan, S. E., 1979, Methods for analysis of inorganic substances in water and fluvial sediments: Book 5, Chapter A1, U.S. Geological Survey Techniques of Water-Resources Investigations, 626 p.

U.S. Army Corps of Engineers, 1974, Susquehanna mine drainage study, interim report, Tioga River basin: U.S. Army Corps of Engineers, Baltimore District, 309 p.

U.S. Geological Survey, 1975, 1974 Water Resources Data for Pennsylvania, Part 2. Water Quality Records: U.S. Geological Survey Water-Data Report, 464 p.

_____1976, Water Resources Data for Pennsylvania, Water Year 1975, Volume 2. Susquehanna and Potomac River Basins: U.S. Geological Survey Water-Data Report PA-75-2, 363 p.

_____1977, Water Resources Data for Pennsylvania, Water Year 1976, Volume 2, Susquehanna and Potomac River Basins: U.S. Geological Survey Water-Data Report PA-76-2, 395 p.

_____1978, Water Resources Data for Pennsylvania, Water Year 1977, Volume 2. Susquehanna and Potomac River Basins: U.S. Geological Survey Water-Data Report PA-77-2, 384 p.

_____1979, Water Resources Data for Pennsylvania, Water Year 1978, Volume 2. Susquehanna and Potomac River Basins: U.S. Geological Survey Water-Data Report PA-78-2, 411 p.

Ward, J. R., 1976, Preliminary results of preimpoundment water-quality studies in the Tioga River basin, Pennsylvania and New York: U.S. Geological Survey Water-Resources Investigations 76-66, 79 p.

Table 23.—Diel measurements of water temperature, specific conductance, pH, and dissolved oxygen at selected sites

TIOGA RIVER AT LAMBS CREEK

TEMPERATURE, IN DEGREES CELSIUS, AT INDICATED HOURS

DATE		1	2	3	4	5	6	7	8	9	10	11	12
3/08/76	AM												
	PM	2.7	3.7	4.3	4.7	4.6	4.4	4.0	3.6	3.2	2.7		
3/09/76	AM	1.3	1.0	0.8	0.6	0.3	0.2	0.2	0.2	0.3	0.5	0.[illegible]	[illegible]
	PM	1.0	1.1	1.3	1.4	1.4	1.3	1.2	1.2	1.1	0.9	0.8	0.7
3/10/76	AM	0.7	0.6	0.6	0.6	0.5	0.5	0.5	0.7	0.9	1.2	1.6	1.1
4/09/76	AM												16.7
	PM	17.6	18.7	19.8	20.3	20.4	20.0	19.2	18.4	17.5	16.8	16.3	15.9
4/10/76	AM	15.4	14.8	14.3	13.8	13.5	13.1	12.7	12.3	12.3	12.8	13.7	14.9
	PM	16.8	19.0	20.6	21.3	21.5	21.2	20.6	19.8	19.1	18.3	17.4	16.9
4/11/76	AM	16.3	15.8	15.4	14.9	14.5	14.1	13.9	13.7	14.0	14.8	16.5	16.1
	PM	20.1	21.6	22.8	22.6	22.1	22.0	21.4	21.1				
4/27/76	PM				6.5	6.7	6.6	6.4	6.3	6.2	6.2	6.1	6.0
4/28/76	AM	5.9	5.7	5.5	5.3	5.2	4.9	4.9	4.9	4.9	5.6	6.7	7.8
	PM	8.8	9.5	9.8	10.3	10.3	10.0	9.8	9.9	9.7	9.5	9.4	9.4
4/29/76	AM	9.2	8.8	8.4	8.0	7.7	7.3	7.0	6.8	6.8	7.3	8.4	9.3
	PM	11.2	12.2	12.9	13.5	13.7	13.8	13.5	13.1	12.9	12.0	11.8	11.4
4/30/76	AM	11.1	10.5	9.9	9.2	8.6	7.9	7.4	7.0	7.0	7.4	8.5	9.9
	PM	11.2	12.9	14.5	15.3	16.2	16.5	16.4	15.9	15.4	14.8	14.2	13.6
5/01/76	AM	13.0	12.4	11.8	11.3	10.7	10.2	9.8	9.6	9.5	9.7	10.0	10.6
	PM	10.9	11.0	11.0	10.9	11.0	11.2	11.4	11.5	11.4	11.3	11.2	11.0
5/02/76	AM	10.9	10.7	10.5	10.2	9.8	9.6	9.3	9.2	9.1	9.[illegible]	9.7	10.7
	PM	12.1	12.8	13.9	14.9	15.4	15.6	15.0	14.3	13.8	13.7	13.5	13.1
5/03/76	AM	12.6	12.1	11.7	11.3	11.0	10.8	10.4	10.2	9.8	9.7	9.8	10.6
	PM	11.9	12.3	12.8	13.1	13.2	12.8	12.4	11.8	11.4	10.9	10.6	10.3
5/04/76	AM	10.0	9.7	9.2	8.8	8.3	7.8	7.6	7.2	7.1	7.0		
9/14/78	AM									15.2	15.9	15.9	16.6
	PM	17.0	17.5	18.2	18.4	18.7	18.6	18.3	17.8	17.3	17.1	16.7	16.5
9/15/78	AM	16.2	16.1	16.0	15.8	15.7	15.5	15.4	15.3	15.2	15.3	15.7	16.2
	PM	17.6	18.8	20.1	20.6	20.8	20.7	20.3	20.1	19.9	19.4	19.0	18.7
9/16/78	AM	18.3	17.9	17.6	17.3	17.1	16.8	16.7	16.6	16.4	16.6	17.0	17.4
	PM	18.0	18.3	19.0	19.3	19.6	19.5	19.3	19.1	18.7	18.3	17.9	17.5
9/17/78	AM	17.2	16.7	16.5	16.2	16.0	15.8	15.6	15.4	15.6	15.7	16.1	16.6
	PM	16.8	17.2	17.6	17.7	17.8	17.8	17.7	17.7	17.7	17.7	17.7	17.[illegible]
9/18/78	PM	17.6											

SPECIFIC CONDUCTANCE, IN MICROMHOS PER CENTIMETER AT 25 DEGREES CELSIUS, AT INDICATED HOURS

DATE		1	2	3	4	5	6	7	8	9	10	11	12
3/08/76	AM												[illegible]
	PM	172	175	175	177	179	179	178	177	180	178	179	179
3/09/76	AM	179	179	180	181	182	184	186	190	189	188	188	186
	PM	183	181	178	182	182	186	185	185	185	187	185	184
3/10/76	AM	182	182	182	181	182	183	183	180	182	181	183	187
4/09/76	AM												310
	PM	320	304	299	278	280	277	277	288	288	298	30[illegible]	307
4/10/76	AM	312	312	306	300	299	298	298	305	306	306	307	309
	PM	305	309	309	310	312	312	319	324	334	325	331	33[illegible]
4/11/76	AM	345	342	337	350	341	345	346	350	360	360	360	365
	PM	367	373	367	366	378	375	383	380				
4/27/76	PM				193	195	196	201	203	203	200	203	203
4/28/76	AM	205	204	203	203	206	203	208	207	210	207	207	208
	PM	216	212	217	217	212	211	217	219	217	216	213	220
4/29/76	AM	214	220	219	217	219	214	218	214	217	219	219	222
	PM	226	222	222	224	221	229	219	218	225	222	219	228
4/30/76	AM	225	223	226	222	225	226	225	225	221	222	229	231
	PM	226	231	234	236	230	229	228	227	229	229	235	229
5/01/76	AM	234	229	233	232	232	230	235	229	233	227	231	233
	PM	234	239	232	235	229	236	235	230	235	234	234	232
/02/76	AM	224	225	228	226	223	218	211	207	205	205	203	199
	PM	193	188	180	183	176	177	176	171	173	177	176	180
5/03/76	AM	176	178	178	184	183	182	183	184	188	192	198	199
	PM	194	198	201	203	198	197	199	200	200	206	203	201
5/04/76	AM	203	201	201	206	206	202	199	205	201	205		
9/14/78	AM									180	392	39[illegible]	394
	PM	392	391	394	395	399	402	406	405	408	410	411	410
9/15/78	AM	412	413	413	450	479	439	430	430	432	430	433	434
	PM	436	435	435	436	438	439	441	445	449	448	448	447
9/16/78	AM	446	445	444	444	444	447	447	450	450	452	450	448
	PM	446	447	447	446	442	441	447	440	441	442	44[illegible]	442
9/17/78	AM	442	443	443	447	446	447	448	450	450	453	45[illegible]	[illegible]
	PM	459	457	458	457	455	457	458	457	457	456	4[illegible]	[illegible]
9/18/78	AM	458											

Table 23.--Diel measurements of water temperature, specific conductance, pH, and dissolved oxygen at selected sites--Continued

TIOGA RIVER AT LAMBS CREEK

pH, IN UNITS, AT INDICATED HOURS

DATE		1	2	3	4	5	6	7	8	9	10	11	12
3/08/76	AM												-
	PM	4.69	4.60	4.69	4.72	4.68	4.73	4.68	4.68	4.60	4.61	4.60	4.39
3/09/76	AM	4.40	4.26	4.26	4.16	4.13	4.10	4.05	4.06	4.01	4.05	4.14	4.34
	PM	4.41	4.54	4.73	4.73	4.71	4.58	4.60	4.54	4.52	4.45	4.51	4.50
3/10/76	AM	4.44	4.46	4.38	4.41	4.41	4.41	4.44	4.51	4.47	4.51	4.58	4.60
4/09/76	AM												5.43
	PM	5.24	5.24	5.33	5.53	5.47	5.37	5.22	5.10	5.05	5.01	5.04	5.05
4/10/76	AM	5.08	5.04	5.11	5.10	5.03	5.07	5.05	5.01	5.01	-	-	4.93
	PM	4.90	4.91	4.80	4.75	4.73	4.71	4.79	4.75	4.82	4.81	4.81	4.80
4/11/76	AM	4.85	4.87	4.82	4.88	4.83	4.82	4.87	4.83	4.86	4.83	4.84	4.75
	PM	4.77	4.65	4.72	4.61	4.59	4.58	4.64	4.60				
4/27/76	PM				5.61	5.56	5.60	5.62	5.58	5.58	5.57	5.60	5.57
4/28/76	AM	5.54	5.51	5.41	5.45	5.41	5.40	5.31	5.30	5.30	5.35	5.34	5.30
	PM	5.20	5.27	5.27	5.21	5.23	5.22	5.21	5.29	5.22	5.23	5.29	5.29
4/29/76	AM	5.21	5.28	5.29	5.28	5.27	5.27	5.20	5.19	5.19	5.17	5.23	5.14
	PM	5.17	5.09	5.11	5.09	5.14	5.06	5.13	5.14	5.15	5.10	5.17	5.00
4/30/76	AM	5.17	5.18	5.18	5.18	5.17	5.10	5.12	5.19	5.18	5.12	5.08	5.13
	PM	5.05	5.08	5.05	5.03	5.01	4.94	5.00	5.01	4.95	5.03	4.97	4.97
5/01/76	AM	5.06	5.00	5.07	5.01	5.08	5.02	5.11	5.10	5.10	5.10	5.03	5.04
	PM	5.03	5.04	5.05	5.12	5.05	5.05	5.16	5.10	5.16	5.17	5.18	5.19
5/02/76	AM	5.14	5.28	5.22	5.23	5.25	5.35	5.35	5.44	5.46	5.45	5.40	5.46
	PM	5.44	5.46	5.47	5.53	5.56	5.57	5.51	5.59	5.50	5.55	5.52	5.49
5/03/76	AM	5.47	5.44	5.33	5.38	5.28	5.34	5.26	5.24	5.24	5.25	5.33	5.30
	PM	5.23	5.17	5.23	5.15	5.23	5.22	5.24	5.26	5.20	5.28	5.20	5.19
5/04/76	AM	5.27	5.19	5.20	5.20	5.18	5.18	5.25	5.17	5.25	5.25		
9/14/78	AM									4.85	4.86	4.85	4.85
	PM	4.85	4.83	4.80	4.78	4.77	4.76	4.76	4.77	4.75	4.76	4.77	4.78
9/15/78	AM	4.78	4.77	4.76	4.77	4.77	4.76	4.75	4.75	4.76	4.76	4.75	4.75
	PM	4.75	4.72	4.68	4.66	4.64	4.63	4.62	4.61	4.61	4.62	4.63	4.63
9/16/78	AM	4.63	4.63	4.62	4.62	4.62	4.62	4.62	4.62	4.62	4.63	4.64	4.65
	PM	4.64	4.64	4.64	4.63	4.63	4.63	4.62	4.62	4.62	4.62	4.64	4.63
9/17/78	AM	4.63	4.63	4.63	4.62	4.61	4.59	4.59	4.59	4.58	4.59	4.59	4.59
	PM	4.58	4.67	4.68	4.69	4.68	4.70	4.69	4.69	4.69	4.68	4.68	4.68
9/18/78	AM	4.66											

DISSOLVED OXYGEN, IN MILLIGRAMS PER LITER, AT INDICATED HOURS

DATE		1	2	3	4	5	6	7	8	9	10	11	12
3/08/76	AM												13.16
	PM	12.94	12.50	12.52	12.31	12.28	12.07	12.22	12.36	12.56	12.65	12.95	13.09
3/09/76	AM	13.35	13.43	13.51	13.59	13.72	13.67	13.70	13.66	13.45	13.73	13.48	13.41
	PM	13.33	13.38	13.28	13.38	13.21	13.08	13.17	13.26	13.39	13.36	13.62	13.40
3/10/76	AM	13.48	13.42	13.60	13.43	13.52	13.61	13.59	13.46	13.38	13.26	13.17	12.90
4/09/76	AM												10.45
	PM	10.26	9.90	9.84	9.66	9.47	9.26	9.03	8.86	8.77	8.68	8.74	8.84
4/10/76	AM	8.90	9.16	9.20	9.31	9.42	9.70	9.86	9.96	10.20	10.44	10.52	10.56
	PM	10.18	9.94	9.29	9.02	8.88	8.84	8.71	8.46	8.26	8.23	8.32	8.46
4/11/76	AM	8.56	8.68	8.70	8.85	9.00	9.08	9.19	9.38	9.73	9.80	9.75	9.50
	PM	9.20	8.98	8.62	8.48	8.30	8.26	8.06	7.90				
4/27/76	PM				11.70	11.45	11.47	11.42	11.36	11.26	11.16	11.16	11.27
4/28/76	AM	11.20	11.20	11.47	11.45	11.56	11.60	11.50	11.66	11.67	11.76	11.83	11.85
	PM	11.20	11.11	10.77	10.57	10.40	10.40	10.34	10.37	10.34	10.20	10.15	10.25
4/29/76	AM	10.15	10.22	10.47	10.58	10.54	10.80	10.94	11.06	11.16	11.35	11.34	10.95
	PM	10.70	10.27	10.17	9.85	9.80	9.78	9.65	9.60	9.67	9.63	9.53	9.70
4/30/76	AM	9.57	9.77	10.04	10.13	10.46	10.52	10.62	11.10	11.26	11.24	11.24	10.96
	PM	10.83	10.33	9.97	9.73	9.53	9.33	9.14	8.97	9.07	8.93	8.92	8.93
5/01/76	AM	9.22	9.40	9.55	9.62	9.76	9.96	9.94	10.20	10.35	10.47	10.64	10.52
	PM	10.41	10.30	10.16	10.32	10.32	10.13	10.04	9.96	9.78	9.74	9.54	9.70
5/02/76	AM	9.56	9.57	9.77	9.93	9.98	10.00	10.14	10.13	10.17	10.56	10.62	10.42
	PM	10.20	10.22	10.02	9.75	9.58	9.30	9.53	9.40	9.26	9.05	9.04	9.25
5/03/76	AM	9.30	9.43	9.52	9.70	9.61	9.82	9.78	9.86	10.25	10.15	10.12	10.12
	PM	10.16	10.20	10.10	9.75	9.81	9.86	9.80	9.73	9.86	9.86	10.04	9.82
5/04/76	AM	10.07	10.16	10.24	10.53	10.43	10.55	10.84	10.90	11.06	11.24		
9/14/78	AM									10.00	10.60	10.70	10.60
	PM	10.58	10.50	10.35	10.20	10.07	9.95	9.85	9.70	9.60	9.52	9.52	9.52
9/15/78	AM	9.58	9.62	9.66	9.65	9.70	9.75	9.85	9.92	10.00	10.25	10.45	10.55
	PM	10.50	10.30	9.95	9.75	9.60	9.50	9.35	9.10	8.82	8.83	8.82	8.96
9/16/78	AM	8.95	9.05	9.15	9.20	9.30	9.32	9.45	9.60	9.80	9.82	10.10	10.20
	PM	10.15	10.00	9.97	9.90	9.85	9.70	9.55	9.35	9.15	9.10	9.10	9.15
9/17/78	AM	9.20	9.30	9.40	9.47	9.53	9.60	9.70	9.92	10.05	10.45	10.55	10.55
	PM	10.50	10.40	10.40	10.30	10.20	10.10	9.90	9.67	9.47	9.30	9.27	9.20
9/18/78	AM	9.20											

Table 23.—Diel measurements of water temperature, specific conductance, pH, and dissolved oxygen at selected sites--Continued

MILL CREEK NEAR TIOGA

TEMPERATURE, IN DEGREES CELSIUS, AT INDICATED HOURS

DATE		1	2	3	4	5	6	7	8	9	10	11	12
10/06/76	AM										13.5	13.9	14.5
	PM	15.6	16.3	16.6	16.5	16.2	15.8	15.4	15.1	14.8	14.7	14.7	14.5
10/07/76	AM	14.4	14.3	14.2	14.1	13.9	13.7	13.6	13.6	13.9	14.5	15.0	15.1
	PM	15.2	15.3	15.4	15.3	15.0	14.6	14.3	14.1	13.9	13.7	13.4	13.3
10/08/76	AM	13.1	12.9	12.8	12.8	12.6	12.5	12.4	12.3	12.2	12.1	12.2	12.4
	PM	12.7	12.7	12.7	12.7	12.7	12.7	12.6	12.5	12.4	12.3	12.2	12.2
10/09/76	AM	12.1	11.9	11.8	11.7	11.5	11.3	11.2	11.1	10.9	10.6	10.5	10.3
	PM	10.2	10.1	10.0	9.8	9.7	9.7	9.6	9.5	9.3	9.2	9.1	9.0
10/10/76	AM	8.9	8.7	8.6	8.4	8.2	8.1	8.0	7.9	8.0	8.3	8.5	8.7
	PM	9.1	9.4	9.6	9.8	9.6	9.5	9.5	9.3	9.3	9.1	8.9	8.7
10/11/76	AM	8.4	8.3	8.2	7.9	7.8	7.6	7.4	7.3	7.4	7.7	8.2	8.9
	PM	9.5	10.0	10.2	10.3	10.2	9.9	9.7	9.5	9.2	8.9	8.6	8.3
10/12/76	AM	8.0	7.7	7.5	7.2	7.0	6.9	6.7	6.5	6.7	7.2	7.9	
4/12/78	PM				12.1	12.3	11.7	11.2	10.7	10.2	9.7	9.3	9.0
4/13/78	AM	8.8	8.5	8.3	8.0	7.8	7.7	7.6	7.7	8.2	9.0	9.8	10.6
	PM	11.6	12.0	12.7	12.9	12.5	11.9	10.9	10.0	9.3	9.0	8.5	8.0
4/14/78	AM	7.8	7.4	7.2	6.8	6.6	6.2	6.0	6.1	6.1	6.2	6.6	7.0
	PM	7.2	7.7	8.0	7.8	7.8	7.7	7.2	6.9	6.5	6.1	6.0	6.0
4/15/78	AM	5.9	5.8	5.8	5.3	5.1	5.0	4.8	4.9	5.1	5.2	5.6	5.8
	PM	6.2	6.3	6.5	6.6	6.5	6.3	6.0	5.6	5.2	5.1	4.7	4.5
4/16/78	AM	4.3	4.1	4.0	3.8	3.5	3.3	3.4	4.0	4.5	4.9	5.0	5.2
	PM	5.4	5.8	6.3	7.0	6.7	6.4	6.1	5.8	5.3	5.0	4.7	4.1
4/17/78	AM	3.8	3.6	3.4	3.3	3.3	3.2	3.2	3.3	4.1	5.2	6.6	7.3
	PM	7.7	8.3	9.1	9.6	10.1	10.6	8.7	8.0	7.5	7.0	6.5	6.0
4/18/78	AM	5.7	5.1	4.7	4.3	4.0	3.8	3.5	4.0	5.0	6.3	7.1	9.2
	PM	10.4	11.2	11.4	11.3	11.2	10.8	10.2	9.6	9.0	8.7	8.4	8.1
4/19/78	AM	7.8	7.5	7.3	7.1	6.8	6.7	6.5	6.5	6.4	6.5	6.5	6.7
	PM	6.8	7.0	7.2	7.2	7.1	7.0	7.0	7.0	6.9	6.8	6.8	6.7
4/20/78	AM	6.7	6.6	6.5	6.5	6.5	6.5	6.5	6.5	6.6	6.8	7.2	7.3
	PM	7.6	7.7	7.7									
6/14/78	PM	16.6	18.5	18.4	18.7	19.1	18.7	18.1	17.3	16.2	15.6	15.1	14.6
6/15/78	AM	14.2	13.6	13.2	12.8	12.3	11.9	12.0	12.1	13.1	14.3	15.9	17.1
	PM	18.5	19.6	20.6	21.1	21.2	21.1	20.6	19.8	18.8	17.8	16.8	16.2
6/16/78	AM	15.4	14.8	14.4	14.0	13.6	13.2	12.8	13.1	14.1	15.1	16.5	17.3
	PM	17.9	18.9	19.3	20.6	20.9	20.6	20.2	19.6	18.8	18.3	17.8	17.3
6/17/78	AM	17.1	16.7	16.6	16.4	16.3	15.9	15.8	15.9	16.0	16.2	16.6	17.2
	PM	18.1	18.2	18.2	18.3	18.3	18.2	18.0	17.6	17.4	17.3	17.1	17.0
6/18/78	AM	16.9	16.8	16.6	16.5	16.5	16.5	16.6	16.6	17.1	17.4	18.2	19.8
	PM	22.0	23.4	24.4	24.7	24.4	24.1	23.7	22.9	22.3	21.6	21.1	20.6
6/19/78	AM	20.3	19.9	20.1	19.8	19.5	19.4	19.2	19.1	19.3	19.5	19.3	19.2
	PM	19.3	19.6	19.4	19.8	20.2	20.7	20.7	20.3	19.5	19.0	18.5	18.1
6/20/78	AM	17.7	17.3	16.9	16.7	16.5	16.4	16.3	16.3	16.7	18.0	19.7	21.1
	PM	22.8	24.1	25.0	25.5	25.6	25.6	25.0	24.3	23.3	22.0	20.6	20.3
6/21/78	AM	20.1	19.5	18.9	18.6	18.4	17.9	17.7	18.1	18.3	19.2	19.7	20.2
	PM	21.2	22.3	23.2	22.7	21.7	21.4	21.3	20.7	20.5	19.7	19.6	19.6
6/22/78	AM	19.5	19.1	18.8	18.5	18.2	17.9	17.6	17.8	18.1	18.6	19.2	20.0
	PM	20.6	21.3	22.0	22.3	22.6	22.3	21.7	21.1	20.6	20.0	19.3	18.6
6/23/78	AM	17.9	17.4	17.0	16.6	15.8	15.6	15.5	15.6	16.3			
9/07/78	AM											20.7	21.0
	PM	21.0	20.8	21.4	21.8	22.0	21.9	21.6	20.9	20.3	19.8	19.3	18.8
9/08/78	AM	18.6	18.4	18.2	18.0	17.9	17.7	17.4	17.3	17.3	17.3	17.4	17.6
	PM	17.7	17.9	18.1	18.0	18.0	18.0	18.1	18.1	17.9	17.9	17.8	17.8
9/09/78	AM	17.8	17.7	17.6	17.3	17.0	16.9	16.7	16.6	16.7	17.1	18.3	19.9
	PM	21.5	22.5	23.0	23.6	21.9	20.7	19.9	18.9	18.0	17.5	17.0	16.5
9/10/78	AM	16.0	15.4	15.0	14.7	14.3	13.9	13.6	13.6	14.1	15.1	16.6	18.2
	PM	18.8	19.1	18.2	17.5	17.1	17.2	17.0	16.6	16.3	16.0	15.7	14.5
9/11/78	AM	14.3	14.1	14.0	14.2	14.3	14.4	14.5	14.7	14.9	15.4	16.2	18.2
	PM	19.4	19.7	20.3	20.7	20.9	20.8	20.3	19.8	19.3	18.8	18.4	18.2
9/12/78	AM	18.1	17.8	17.7	17.6	17.5	17.3	17.2	17.3	17.7	17.8	18.3	18.8
	PM	18.5	18.2	18.0	17.8	17.7	17.4	17.0	16.6	16.3	15.8	15.4	15.2
9/13/78	AM	15.0	14.8	14.7	14.6	14.5	14.3	14.1	13.8	14.2	15.3	16.6	18.2
	PM	19.6	20.7	21.3	21.4	20.8	19.6	18.4	17.7	17.1	16.7	16.3	16.1
9/14/78	AM	15.9	15.7	15.4	15.2	14.9	14.7						

Table 23.--Diel measurements of water temperature, specific conductance, pH, and dissolved oxygen at selected sites--Continued

MILL CREEK NEAR TIOGA

SPECIFIC CONDUCTANCE, IN MICROMHOS PER CENTIMETER AT 25 DEGREES CELSIUS, AT INDICATED HOURS

DATE		1	2	3	4	5	6	7	8	9	10	11	12
10/06/76	AM										208	206	208
	PM	204	196	198	198	197	197	203	204	201	206	202	207
10/07/76	AM	206	209	208	207	211	215	215	208	208	214	206	210
	PM	207	205	204	206	200	203	204	201	205	199	196	194
10/08/76	AM	190	188	193	196	193	189	198	194	188	185	190	187
	PM	193	194	201	196	193	191	195	194	193	191	195	191
10/09/76	AM	194	193	192	194	189	188	200	185	174	159	154	134
	PM	116	99	88	84	80	77	77	77	81	85	89	91
10/10/76	AM	95	94	99	100	100	103	104	104	106	105	107	105
10/10/76	PM	106	107	111	114	109	112	113	115	113	116	115	115
10/11/76	AM	119	117	118	120	119	119	122	124	121	125	124	120
	PM	123	119	121	121	124	121	122	124	128	129	127	130
10/12/76	AM	130	127	131	131	128	131	128	131	132	131	130	
4/12/78	PM				95	95	96	98	99	101	102	104	105
4/13/78	AM	104	105	105	106	104	106	107	106	106	104	104	100
	PM	100	99	99	100	101	101	101	105	107	108	108	108
4/14/78	AM	108	108	109	110	108	108	109	109	108	108	109	107
	PM	107	107	110	108	109	110	109	110	111	111	112	112
4/15/78	AM	110	112	112	113	112	112	113	112	112	113	113	112
	PM	111	111	112	111	111	111	112	113	115	114	115	115
4/16/78	AM	115	116	115	117	116	117	116	117	116	113	115	114
	PM	114	113	112	112	111	113	113	114	116	116	119	119
4/17/78	AM	119	120	120	121	119	118	119	118	117	116	114	113
	PM	112	113	112	111	112	112	112	113	115	118	121	119
4/18/78	AM	122	121	121	123	127	122	122	120	120	118	116	117
	PM	114	113	113	112	112	112	112	114	118	115	117	117
4/19/78	AM	120	121	121	120	121	121	121	121	121	121	119	119
	PM	120	119	118	118	118	119	119	119	120	119	119	121
4/20/78	AM	121	120	120	121	121	121	121	120	120	118	118	116
	PM	116	115	114									
6/14/78	PM	140	143	142	142	142	144	147	147	148	151	154	155
6/15/78	AM	155	155	157	157	156	156	155	157	155	153	153	155
	PM	152	148	145	146	146	146	146	147	148	152	152	153
6/16/78	AM	156	158	158	158	159	159	159	158	159	157	156	155
	PM	149	153	153	149	148	146	145	147	151	154	156	157
6/17/78	AM	158	158	158	159	161	161	162	161	160	160	158	159
	PM	156	155	155	154	154	152	153	153	153	153	154	155
6/18/78	AM	156	156	158	162	163	160	158	159	157	157	156	156
	PM	154	154	151	155	154	153	153	153	153	156	156	157
6/19/78	AM	162	169	169	163	159	155	150	144	143	143	143	147
	PM	147	149	149	148	146	147	149	150	150	151	152	152
6/20/78	AM	154	155	155	156	156	156	156	155	154	155	156	156
	PM	153	150	149	142	141	143	144	146	146	147	149	149
6/21/78	AM	150	150	152	154	153	153	154	154	153	153	151	151
	PM	151	153	149	147	147	147	147	145	144	143	145	145
6/22/78	AM	132	130	131	133	134	136	137	138	138	138	139	140
	PM	137	138	138	138	140	138	140	141	143	146	148	150
6/23/78	AM	150	147	148	149	151	151	152	152	151			
9/07/78	AM											208	209
	PM	210	211	210	210	208	206	208	211	213	215	216	214
9/08/78	AM	214	214	215	216	218	216	215	212	213	214	215	213
	PM	213	213	212	214	214	215	216	217	217	218	219	218
9/09/78	AM	218	220	220	220	221	222	222	222	223	220	216	213
	PM	220	218	216	216	216	217	219	221	223	223	225	224
9/10/78	AM	225	226	228	229	231	231	232	230	229	227	224	220
	PM	208	206	206	205	203	201	203	206	207	208	210	211
9/11/78	AM	210	211	211	213	213	213	213	215	215	214	213	211
	PM	209	206	203	201	198	198	200	202	206	207	207	208
9/12/78	AM	208	210	213	213	213	213	214	213	209	204	202	202
	PM	205	204	204	205	205	207	207	210	211	211	212	214
9/13/78	AM	213	213	215	216	216	217	216	216	216	215	212	207
	PM	205	203	200	198	197	198	201	203	206	206	207	207
9/14/78	AM	208	208	210	213	213	213						

Table 23.—Diel measurements of water temperature, specific conductance, pH, and dissolved oxygen at selected sites--Continued

MILL CREEK NEAR TIOGA

pH, IN UNITS, AT INDICATED HOURS

DATE		1	2	3	4	5	6	7	8	9	10	11	12
10/06/76	AM										8.04	8.25	8.36
	PM	8.56	8.65	8.78	8.79	8.69	8.63	8.27	7.96	7.69	7.56	7.59	7.47
10/07/76	AM	7.46	7.43	7.53	7.43	7.53	7.53	7.46	7.60	7.87	8.11	8.36	8.40
	PM	8.40	8.50	8.57	8.47	8.28	7.96	7.82	7.66	7.51	7.54	7.55	7.53
10/08/76	AM	7.41	7.43	7.55	7.56	7.57	7.53	7.57	7.57	7.57	7.73	7.79	7.93
	PM	7.97	8.00	7.97	7.91	7.85	7.74	7.71	7.58	7.65	7.63	7.63	7.62
10/09/76	AM	7.62	7.63	7.61	7.54	7.63	7.64	7.67	7.55	7.59	7.50	7.35	7.38
	PM	7.13	7.06	6.95	6.86	6.77	6.89	6.77	7.06	7.11	6.99	6.93	7.06
10/10/76	AM	7.04	7.02	7.16	7.07	7.06	7.21	7.19	7.11	7.23	7.16	7.26	7.27
	PM	7.18	7.31	7.32	7.33	7.23	7.34	7.33	7.23	7.34	7.32	7.34	7.24
10/11/76	AM	7.22	7.25	7.35	7.25	7.33	7.25	7.33	7.26	7.26	7.34	7.33	7.33
	PM	7.35	7.45	7.45	7.36	7.46	7.45	7.42	7.41	7.31	7.39	7.31	7.41
10/12/76	AM	7.40	7.40	7.32	7.32	7.40	7.40	7.39	7.34	7.42	7.44	7.46	
4/12/78	PM				7.96	7.77	7.66	7.41	7.24	7.16	7.16	7.14	7.13
4/13/78	AM	7.15	7.14	7.10	7.13	7.11	7.15	7.23	7.33	7.46	7.72	7.86	7.95
	PM	8.07	8.12	8.25	8.27	8.23	8.02	7.59	7.35	7.26	7.24	7.23	7.22
4/14/78	AM	7.22	7.20	7.22	7.20	7.18	7.26	7.40	7.58	7.78	7.90	7.92	7.98
	PM	8.08	8.13	8.23	8.20	8.11	7.97	7.59	7.35	7.30	7.25	7.25	7.25
4/15/78	AM	7.23	7.23	7.23	7.25	7.22	7.27	7.36	7.57	7.79	7.96	8.06	8.18
	PM	8.28	8.33	8.36	8.43	8.43	8.26	7.76	7.43	7.34	7.31	7.28	7.27
4/16/78	AM	7.26	7.27	7.27	7.27	7.27	7.31	7.51	7.77	7.96	8.03	8.17	8.25
	PM	8.34	8.40	8.48	8.52	8.44	8.29	7.96	7.54	7.39	7.33	7.31	7.26
4/17/78	AM	7.18	7.17	7.18	7.18	7.17	7.20	7.43	7.66	7.93	8.12	8.26	8.37
	PM	8.50	8.63	8.73	8.81	8.87	8.82	8.59	8.02	7.58	8.41	8.36	7.35
4/18/78	AM	7.35	7.34	7.34	7.34	7.35	7.36	7.65	7.90	8.07	8.31	8.44	8.54
	PM	8.70	8.78	8.97	9.04	9.04	9.03	8.90	8.35	7.74	7.53	7.43	7.37
4/19/78	AM	7.36	7.36	7.36	7.36	7.36	7.36	7.39	7.51	7.65	7.90	8.20	8.37
	PM	8.41	8.63	8.69	8.68	8.58	8.26	7.82	7.52	7.44	7.41	7.38	7.40
4/20/78	AM	7.37	7.36	7.36	7.36	7.36	7.35	7.42	7.58	7.86	8.25	8.47	8.53
	PM	8.63	8.66	8.65									
6/14/78	PM	8.60	8.67	8.75	8.86	8.97	9.01	8.99	8.76	8.32	7.77	7.61	7.50
6/15/78	AM	7.47	7.47	7.50	7.51	7.51	7.51	7.63	7.90	8.15	8.42	8.58	8.66
	PM	8.77	8.89	9.00	9.08	9.10	9.10	9.10	8.99	8.70	8.17	7.65	7.65
6/16/78	AM	7.55	7.48	7.48	7.50	7.50	7.54	7.70	7.92	8.21	8.45	8.62	8.77
	PM	8.92	9.03	9.10	9.31	9.47	9.50	9.41	9.16	8.80	8.37	7.92	7.67
6/17/78	AM	7.65	7.62	7.57	7.53	7.52	7.52	7.63	7.73	7.86	8.11	8.30	8.47
	PM	8.63	8.72	8.73	8.85	8.87	8.85	8.72	8.41	8.08	7.74	7.70	7.60
6/18/78	AM	7.51	7.50	7.51	7.50	7.41	7.53	7.68	7.83	8.02	8.26	8.43	8.50
	PM	8.67	8.70	8.80	8.83	8.83	8.81	8.70	8.40	8.02	7.74	7.65	7.52
6/19/78	AM	7.48	7.62	7.59	7.55	7.50	7.45	7.41	7.43	7.47	7.50	7.50	7.52
	PM	7.61	7.68	7.70	7.74	7.85	7.88	7.78	7.73	7.55	7.50	7.50	7.50
6/20/78	AM	7.48	7.47	7.46	7.45	7.47	7.47	7.48	7.60	7.80	7.92	8.02	8.07
	PM	8.20	8.55	8.38	8.30	8.33	8.28	8.29	8.00	7.78	7.68	7.58	7.55
6/21/78	AM	7.54	7.54	7.54	7.52	7.52	7.55	7.68	7.83	7.92	8.08	8.08	8.15
	PM	8.27	8.33	8.35	8.03	7.78	7.73	7.86	7.75	7.68	7.60	7.65	7.60
6/22/78	AM	7.53	7.52	7.50	7.52	7.53	7.53	7.53	7.62	7.72	7.85	7.92	8.02
	PM	8.07	8.15	8.19	8.25	8.31	8.12	8.13	7.90	7.72	7.63	7.60	7.55
6/23/78	AM	7.55	7.55	7.55	7.55	7.55	7.60	7.70	7.88	7.96			
9/07/78	AM											8.26	8.27
	PM	8.20	8.14	8.30	8.52	8.63	8.58	8.22	7.91	7.66	7.57	7.52	7.48
9/08/78	AM	7.47	7.46	7.47	7.47	7.47	7.47	7.47	7.51	7.58	7.73	7.87	8.01
	PM	8.06	8.16	8.21	8.13	7.94	7.84	7.74	7.63	7.56	7.53	7.52	7.51
9/09/78	AM	7.51	7.53	7.53	7.54	7.55	7.54	7.59	7.74	7.90	8.16	8.40	8.55
	PM	8.65	8.73	8.76	8.78	8.78	8.70	8.55	8.17	7.80	7.56	7.39	7.57
9/10/78	AM	7.56	7.55	7.54	7.54	7.55	7.55	7.57	7.77	8.03	8.24	8.39	8.51
	PM	8.63	8.65	8.40	8.10	7.98	8.04	8.18	8.15	8.00	7.82	7.66	7.60
9/11/78	AM	7.54	7.53	7.53	7.53	7.55	7.54	7.56	7.79	7.85	8.06	8.23	8.41
	PM	8.58	8.68	8.74	8.80	8.82	8.75	8.56	8.24	7.83	7.66	7.60	7.56
9/12/78	AM	7.56	7.55	7.55	7.55	7.55	7.54	7.56	7.63	7.68	7.81	8.15	8.26
	PM	8.34	8.33	8.37	8.34	8.29	8.11	7.93	7.73	7.65	7.62	7.60	7.60
9/13/78	AM	7.60	7.60	7.60	7.60	7.60	7.61	7.63	7.75	8.10	8.26	8.42	8.55
	PM	8.65	8.71	8.76	8.78	8.76	8.65	8.45	7.95	7.80	7.67	7.64	7.60
9/14/78	AM	7.57	7.57	7.57	7.57	7.57	7.57						

Table 23.—Diel measurements of water temperature, specific conductance, pH, and dissolved oxygen at selected sites--Continued

MILL CREEK NEAR TIOGA

DISSOLVED OXYGEN, IN MILLIGRAMS PER LITER, AT INDICATED HOURS

DATE		1	2	3	4	5	6	7	8	9	10	11	12
10/06/76	AM										10.70	11.06	11.44
	PM	11.67	11.62	11.32	10.91	10.46	9.87	9.05	8.84	8.60	8.63	8.55	8.50
10/07/76	AM	8.54	8.55	8.58	8.57	8.61	8.60	8.75	9.11	10.16	10.67	11.10	10.80
	PM	10.67	10.71	10.83	10.52	9.95	9.36	9.00	8.94	8.84	8.85	9.04	9.06
10/08/76	AM	9.10	9.20	9.14	9.20	9.38	9.45	9.51	9.61	9.70	9.88	10.08	10.43
	PM	10.55	10.45	10.26	10.04	10.03	9.88	9.66	9.54	9.59	9.55	9.55	9.61
10/09/76	AM	9.57	9.67	9.73	9.73	9.71	9.70	9.80	9.91	9.99	10.15	10.00	10.14
	PM	10.66	10.56	10.36	10.60	10.71	10.81	10.90	11.04	11.09	11.01	11.06	11.06
10/10/76	AM	11.13	11.14	11.16	11.15	11.08	11.26	11.14	11.07	11.10	11.03	10.97	10.96
	PM	10.84	10.69	10.70	10.45	10.45	10.46	10.40	10.46	10.50	10.55	10.58	10.63
10/11/76	AM	10.68	10.70	10.77	10.87	10.73	10.85	10.91	10.96	10.96	11.00	10.96	10.75
	PM	10.60	10.36	10.06	10.28	10.02	10.06	10.08	10.05	10.15	10.30	10.38	10.47
10/12/76	AM	10.57	10.63	10.64	10.80	10.84	10.93	10.85	11.02	10.94	10.94	10.95	
4/12/78	PM				10.72	10.80	10.75	10.58	10.50	10.57	10.70	10.75	10.88
4/13/78	AM	10.93	10.98	11.07	11.10	11.20	11.30	11.60	11.95	12.00	11.90	11.72	11.50
	PM	11.25	11.03	10.88	10.72	10.68	10.63	10.48	10.43	10.52	10.68	10.78	11.00
4/14/78	AM	11.20	11.13	11.20	11.32	11.42	11.52	12.00	12.30	12.45	12.40	12.42	12.40
	PM	12.35	12.12	11.95	11.82	11.78	11.70	11.38	11.32	11.50	11.60	11.72	11.72
4/15/78	AM	11.75	11.83	11.87	11.90	11.95	12.12	12.35	12.72	13.02	13.08	12.95	12.93
	PM	12.82	12.70	12.65	12.63	12.54	12.25	12.00	11.83	11.90	11.93	12.12	12.25
4/16/78	AM	12.40	12.43	12.52	12.60	12.80	12.87	13.37	13.60	13.63	13.58	13.52	13.47
	PM	13.32	13.10	13.05	12.80	12.65	12.47	12.20	11.95	11.92	12.07	12.15	12.32
4/17/78	AM	12.53	12.68	12.73	12.73	12.75	12.90	13.26	13.70	13.78	13.52	13.12	12.92
	PM	12.85	12.55	12.27	12.03	11.85	11.73	11.40	11.15	11.23	11.35	11.48	11.65
4/18/78	AM	11.96	12.08	12.32	12.38	12.72	12.90	13.35	13.66	13.60	13.32	12.90	12.60
	PM	12.32	12.02	11.88	11.78	11.62	11.45	11.08	10.70	10.70	10.80	10.90	11.01
4/19/78	AM	11.20	11.35	11.33	11.40	11.50	11.55	11.72	12.01	12.32	12.63	12.92	12.90
	PM	12.97	13.00	12.92	12.70	12.28	12.00	11.68	11.48	11.45	11.42	11.40	11.40
4/20/78	AM	11.47	11.50	11.50	11.50	11.50	11.55	11.78	12.22	12.75	12.91	12.95	12.75
	PM	12.65	12.38	12.08									
6/14/78	PM	10.90	10.63	10.52	10.46	10.34	10.12	9.92	9.57	9.12	9.03	9.04	9.22
6/15/78	AM	9.25	9.40	9.60	9.70	9.82	10.02	10.60	11.21	11.45	11.45	11.24	11.06
	PM	10.97	10.67	10.40	10.28	10.10	9.80	9.52	9.03	8.55	8.46	8.55	8.69
6/16/78	AM	8.88	9.02	9.18	9.22	9.43	9.65	10.22	10.92	11.35	11.48	11.40	11.18
	PM	11.05	10.95	10.78	10.62	10.08	9.78	9.55	9.00	8.60	8.22	8.22	8.28
6/17/78	AM	8.41	8.50	8.50	8.57	8.65	8.72	9.10	9.42	9.75	10.15	10.45	10.60
	PM	10.50	10.35	10.22	10.12	10.00	9.75	9.25	8.82	8.52	8.45	8.45	8.45
6/18/78	AM	8.45	8.48	8.50	8.50	8.50	8.62	9.00	9.35	9.80	10.05	10.07	10.00
	PM	9.70	9.45	9.12	8.80	8.50	8.35	7.85	7.50	7.25	7.20	7.30	7.40
6/19/78	AM	7.45	7.70	7.82	7.87	7.95	7.93	8.00	8.06	8.26	8.28	8.32	8.45
	PM	8.58	8.66	8.64	8.67	8.75	8.60	8.50	8.30	8.10	8.10	8.18	8.27
6/20/78	AM	8.35	8.45	8.50	8.60	8.65	8.70	8.88	9.13	9.46	9.50	9.48	9.10
	PM	8.80	8.43	8.30	8.13	8.05	7.93	7.75	7.44	7.28	7.28	7.43	7.63
6/21/78	AM	7.73	7.86	7.95	8.05	8.12	8.26	8.70	9.13	9.12	9.12	9.00	9.06
	PM	9.06	8.93	8.62	7.88	7.70	7.85	8.08	7.98	7.85	7.85	7.90	7.90
6/22/78	AM	7.90	8.00	8.10	8.20	8.30	8.33	8.43	8.66	8.87	8.93	8.95	8.97
	PM	8.90	8.80	8.73	8.67	8.52	8.28	8.18	8.10	7.90	7.90	8.00	8.10
6/23/78	AM	8.20	8.35	8.47	8.60	8.70	8.80	9.20	9.55	9.72			
9/07/78	AM											9.52	9.55
	PM	9.00	9.05	10.05	10.06	10.05	9.40	8.28	7.80	7.68	7.75	7.88	8.03
9/08/78	AM	8.10	8.15	8.22	8.26	8.28	8.35	8.45	8.68	8.90	9.32	9.80	9.95
	PM	9.97	10.12	10.07	9.55	9.15	9.05	8.80	8.52	8.23	8.32	8.43	8.50
9/09/78	AM	8.50	8.48	8.55	8.65	8.72	8.72	9.00	9.63	10.05	10.75	11.05	10.90
	PM	10.75	10.53	10.25	9.90	9.92	9.73	9.25	8.53	8.50	8.50	8.70	8.90
9/10/78	AM	9.05	9.15	9.28	9.41	9.50	9.60	9.88	10.38	11.13	11.50	11.53	11.36
	PM	11.18	10.60	9.50	9.35	10.05	10.45	9.80	9.15	9.03	9.03	9.03	9.27
9/11/78	AM	9.28	9.32	9.35	9.31	9.30	9.27	9.36	9.87	10.20	10.80	11.0	11.33
	PM	11.23	11.0	10.84	10.83	10.59	10.02	9.40	8.83	8.37	8.35	8.43	8.55
9/12/78	AM	8.65	8.70	8.75	8.78	8.78	8.80	8.92	9.45	9.50	9.80	10.52	10.40
	PM	10.32	10.30	10.48	10.30	10.12	9.70	9.35	9.10	9.13	9.22	9.32	9.50
9/13/78	AM	9.55	9.58	9.70	9.65	9.68	9.70	9.95	10.60	11.25	11.50	11.53	11.35
	PM	11.10	10.93	10.72	10.53	10.28	10.08	9.50	9.10	8.95	9.03	9.08	9.15
9/14/78	AM	9.32	9.40	9.48	9.53	9.65	9.72						

Table 23.—Diel measurements of water temperature, specific conductance, pH, and dissolved oxygen at selected sites--Continued

CROOKED CREEK AT MIDDLEBURY CENTER

TEMPERATURE, IN DEGREES CELSIUS, AT INDICATED HOURS

DATE		1	2	3	4	5	6	7	8	9	10	11	12
4/20/76	PM		16.5	17.4	17.8	18.1	18.5	18.6	18.5	18.4	18.0	17.7	17.3
4/21/76	AM	16.8	16.2	15.6	15.0	14.4	13.8	13.3	12.9	13.0	13.3	14.1	14.9
	PM	16.0	17.2	18.2	19.0	19.4	19.8	19.8	19.8	19.7	19.4	19.1	18.7
4/22/76	AM	17.9	17.3	16.7	16.2	15.8	15.3	14.9	14.7	14.4	14.7	14.9	15.2
	PM	16.0	16.8	17.5	18.0	18.5	18.6	18.5	18.4	18.2	17.9	17.5	16.8
4/23/76	AM	16.2	15.4	14.8	14.4	13.7	13.2	12.7	12.5	12.5	12.8	13.5	14.3
	PM	15.2	16.8	17.6	18.1	18.3	18.4	18.3	18.0	17.6	17.1	16.5	15.5
4/24/76	AM	14.7	13.8	13.1	12.5	11.6	11.2	10.9	10.5	10.2	10.1	9.9	9.9
	PM	10.4	10.9	11.4	11.6	11.8	11.8	11.8	11.8	11.7	11.8	11.5	11.1
4/25/76	AM	10.8	10.4	10.2	9.9	9.7	9.4	9.2	9.2	9.1	9.1	9.4	9.7
	PM	9.8	9.9	10.0	10.1	10.1	10.2	10.2	10.2	10.0	9.8	9.7	9.6
4/26/76	AM	9.4	9.0	8.8	8.5	8.2	7.9	7.8	7.7	7.6	7.5	7.4	7.4
	PM	7.4	7.5	7.6	7.7	7.8	7.7	7.3	7.0	6.8	6.3	6.0	5.7
4/27/76	AM	5.3	5.0	4.8	4.7	4.6	4.5	4.6	4.7	4.9	4.9		
4/21/77	PM					19.7	20.0	20.1	20.0	19.6	19.1	18.4	17.8
4/22/77	AM	17.1	16.6	16.0	15.6	15.1	14.6	14.3	14.4	14.8	15.4	15.9	16.5
	PM	17.1	17.6	18.2	18.4	18.6	18.5	18.3	18.3	18.1	17.7	17.4	17.0
4/23/77	AM	16.7	16.3	15.9	15.6	15.3	14.9	14.5	14.3	14.1	14.0	14.2	14.4
	PM	14.5	14.4	14.6	14.4	14.4	14.2	14.0	13.7	13.2	12.8	12.4	12.2
4/24/77	AM	11.9	11.4	11.2	10.9	10.6	10.4	10.3	10.3	10.4	10.5	10.5	10.8
	PM	11.1	11.2	11.2	11.2	11.1	10.8	10.5	10.3	10.0	9.8	9.5	9.3
4/25/77	AM	9.1	8.8	8.6	8.5	8.3	8.2	8.3	8.3	8.3	8.4	8.7	9.0
	PM	9.5	10.3	10.5	10.8	10.7	10.4	10.0	9.7	9.4	9.0	8.8	8.7
4/26/77	AM	8.5	8.2	8.0	7.8	7.5	7.4	7.4	7.6	7.9	8.9	9.6	9.9
	PM	10.8	11.0	11.0	10.9	10.6	10.2	9.8	9.7	9.3	9.0	8.8	8.6
4/27/77	AM	8.3	8.2	8.0	7.8	7.5	7.3	7.3					
3/23/78	PM			5.5	4.9	4.2	3.3	2.8	2.7	2.5	2.3	2.2	2.1
3/24/78	AM	2.0	1.9	1.8	1.7	1.7	1.7	1.7	1.6	1.5	1.9	2.5	3.2
	PM	4.0	4.9	5.3	5.5	5.2	4.5	3.8	3.1	2.5	2.0	1.6	1.3
3/25/78	AM	1.0	0.8	0.7	0.6	0.5	0.5	0.6	0.7	0.8	1.1	1.3	1.5
	PM	1.7	1.7	1.5	1.1	0.9	0.7	0.7	0.7	0.7			
4/03/78	PM					2.4	2.3	2.2	2.2	2.1	2.0	2.1	2.1
4/04/78	AM	2.1	2.2	2.2	2.2	2.2	2.2	2.3	2.4	2.7	3.2	3.7	4.7
	PM	5.7	6.5	7.1	6.9	6.6	6.2	5.9	5.7	5.5	5.3	5.1	5.0
4/05/78	AM	4.9	4.8	4.8	4.8	4.9	4.7	4.7	4.6	4.5	4.4	4.5	4.7
	PM	4.9	5.2	5.7	5.9	5.8	5.6	5.5	5.1	4.8	4.6	4.5	4.3
4/06/78	AM	4.1	3.7	3.4	3.1	2.9	2.6	2.5	2.6	3.1	3.9	4.8	5.6
	PM	6.2	6.6	6.8	6.6	6.4	6.1	5.9	5.6	5.3	5.2	5.0	4.9
4/07/78	AM	4.7	4.6	4.4	4.3	4.3	4.2	4.2	4.4	4.8	5.6	6.7	7.2
	PM	9.3	10.3	11.1	11.6	11.1	10.6	9.7	8.8	8.1	7.6	7.2	6.7
4/08/78	AM	6.1	5.6	5.1	4.7	4.3	4.2	4.1	4.0	4.2	5.0	5.7	6.3
	PM	6.8	7.2	8.2	8.1	8.0	7.1	7.4	6.9	6.5	6.1	5.8	5.4
4/09/78	AM	5.0	4.7	4.3	4.0	3.8	3.5	3.2	3.4	3.7	4.7	5.9	6.4
	PM	7.7	8.6	9.2	9.3	9.2	8.6	7.8	7.1	6.4	5.8	5.4	5.1
4/10/78	AM	4.8	4.5	4.4	4.2	3.9	3.8	3.6	3.6	3.8	4.4	5.0	5.8
	PM	6.2	7.0	7.9	8.7	9.0	9.0	8.7	8.0	7.6	7.2	6.9	6.5
4/11/78	AM	6.4	6.3	6.2	6.3	6.2	6.3	6.3	6.5	6.8	7.3	8.3	9.6
	PM	10.8	11.8	12.5	12.2	11.8	11.2	10.4	9.6	9.0	8.6	8.0	7.6
4/12/78	AM	7.1	6.7	6.3	6.1	5.8	5.7	5.7	5.7	6.1			
6/23/78	PM	18.3	18.7	19.2	19.7	20.4	21.1	21.5	21.8	21.9	21.8	21.7	21.3
6/24/78	AM	21.1	20.6	20.1	19.5	18.9	18.4	17.8	17.3	17.0	17.2	17.7	18.2
	PM	18.8	19.3	19.9	20.5	20.9	21.4	21.8	22.0	22.0	21.9	21.8	21.7
6/25/78	AM	21.5	21.3	20.8	20.3	19.8	19.3	18.8	18.4	18.0	18.2	18.7	19.1
	PM	19.5	19.8	20.1	20.7	21.0	21.3	21.6	21.8	21.8	21.7	21.6	21.4
6/26/78	AM	21.3	21.2	20.8	20.5	20.2	19.8	19.5	19.3	19.3	18.9	18.8	18.7
	PM	18.6	18.3	18.3	18.3	18.5	18.8	19.1	19.2	19.2	19.2	19.2	19.2
6/27/78	AM	19.2	19.3	19.2	19.2	19.1	19.1	19.1	19.1	19.2	19.3	20.0	21.0
	PM	22.0	22.8	23.2	23.2	23.1	23.1	23.2	23.7	24.1	24.3	24.2	24.0
6/28/78	AM	23.8	23.3	23.2	22.8	22.3	21.8	21.4	21.0	21.0	21.1	21.1	21.6
	PM	22.2	22.7	23.1	23.3	23.6	23.8	23.8	23.8	23.8	23.4	23.3	23.1
6/29/78	AM	22.8	22.3	22.0	21.7	21.3	20.7	20.3	20.1	20.1	20.3	20.7	21.3
	PM	22.0	22.2	22.3	22.6	22.7	22.8	22.8	23.0	23.1	23.1	22.9	22.7
6/30/78	AM	22.6	22.3	22.1	21.8	21.4	21.1	20.8	20.6	20.7	21.0	21.6	22.2
	PM	22.7	23.1	23.3	23.4	23.4	23.2	22.8	22.6	22.3	22.1	21.8	21.5
7/01/78	AM	21.2	20.8	20.6	20.2	19.8	19.3	18.9	18.6	18.7	18.9	19.5	20.0
	PM	20.7	20.9	21.0	20.9	20.8	20.3	20.1	19.8	19.5	19.3	19.2	18.9
7/02/78	AM	18.8	18.7	18.3	18.2	17.8	17.6	17.2	17.0	17.1	17.6	18.2	18.8
	PM	19.2	19.7	20.0	20.2	20.0	19.8	19.6	19.3	19.0	18.8	18.7	18.6
7/03/78	AM	18.5	18.4	18.3	18.2	18.0	17.9	17.8	17.7	17.7	17.6	17.6	17.6
	PM	17.5	17.4	17.2	17.1	16.9	16.8	16.7	16.4	16.2	16.2	16.2	16.2
7/04/78	AM	16.0	15.8	15.7	15.7	15.5	15.3	15.2	15.1	15.0	14.9	14.9	15.1
	PM	15.3	15.6	15.8	16.0	16.2	16.3	16.6	16.8	17.0	17.0	16.9	16.8
7/05/78	AM	16.8	16.8	16.7	16.7	16.7	16.5	16.3	16.2	16.3			

Table 23.—Diel measurements of water temperature, specific conductance, pH, and dissolved oxygen at selected sites--Continued

CROOKED CREEK AT MIDDLEBURY CENTER

SPECIFIC CONDUCTANCE, IN MICROMHOS PER CENTIMETER AT 25 DEGREES CELSIUS, AT INDICATED HOURS

DATE		1	2	3	4	5	6	7	8	9	10	11	12
4/20/76	PM		179	187	183	179	173	176	180	184	180	190	183
4/21/76	AM	183	184	186	189	193	193	197	197	189	195	187	193
	PM	183	186	186	179	181	178	182	180	186	193	189	198
4/22/76	AM	191	192	200	199	194	192	190	178	178	191	189	190
	PM	191	186	191	188	178	177	183	184	183	190	190	185
4/23/76	AM	190	195	190	192	197	192	198	197	189	193	192	193
	PM	193	197	193	187	183	193	192	187	188	199	191	195
4/24/76	AM	201	196	197	199	200	199	200	196	192	194	189	192
	PM	192	197	195	190	191	189	193	192	193	187	186	191
4/25/76	AM	193	194	190	190	193	191	185	189	185	187	185	183
	PM	184	189	189	188	199	197	198	198	194	200	203	194
4/26/76	AM	198	195	193	195	188	189	193	187	192	187	185	189
	PM	182	183	187	183	185	179	182	187	188	180	180	186
4/27/76	AM	181	180	179	180	179	183	180	179	176	179		
4/21/77	PM					129	132	136	139	148	149	148	152
4/22/77	AM	157	159	169	163	167	173	174	176	173	169	170	161
	PM	168	156	154	160	155	155	154	157	164	161	163	172
4/23/77	AM	177	174	175	182	180	185	178	185	183	172	178	169
	PM	167	173	169	163	162	164	165	163	173	172	173	168
4/24/77	AM	169	161	159	154	141	148	149	150	149	140	138	137
	PM	139	136	133	136	133	132	131	130	136	134	135	134
4/25/77	AM	130	128	129	132	131	131	128	124	125	125	123	122
	PM	119	124	122	123	119	124	120	126	124	124	125	123
4/26/77	AM	125	123	126	123	121	125	122	124	121	116	118	116
	PM	119	115	120	119	121	122	121	123	121	125	122	121
4/27/77	AM	121	125	121	122	125	125	124					
3/23/78	PM			76	73	70	68	70	72	74	77	78	78
3/24/78	AM	80	82	83	83	84	94	85	86	88	87	87	88
	PM	87	89	89	89	90	91	92	94	95	95	96	96
3/25/78	AM	97	97	97	97	97	97	97	99	99	99	99	98
	PM	99	99	98	98	99	99	98	98	98			
4/03/78	PM					87	87	88	90	87	89	88	90
4/04/78	AM	91	90	92	91	91	93	93	93	93	93	94	92
	PM	92	92	91	95	98	97	96	97	100	101	102	101
4/05/78	AM	101	100	99	99	99	100	100	100	100	99	100	98
	PM	97	96	94	95	95	94	95	96	97	95	95	96
4/06/78	AM	96	98	98	96	97	97	96	94	91	91	91	91
	PM	92	89	91	92	93	95	93	95	93	94	95	96
4/07/78	AM	98	102	102	103	99	98	100	98	97	95	93	94
	PM	92	92	92	89	88	89	88	90	89	90	89	88
4/08/78	AM	88	88	90	86	88	87	88	89	86	86	85	85
	PM	85	85	85	85	84	87	88	90	91	90	91	91
4/09/78	AM	93	94	94	92	94	95	96	95	93	90	91	90
	PM	90	90	90	90	91	93	94	96	97	97	98	98
4/10/78	AM	100	101	99	99	98	102	102	101	96	94	96	94
	PM	96	96	94	92	94	95	95	98	97	99	99	98
4/11/78	AM	100	101	101	100	100	100	101	100	100	99	97	96
	PM	94	95	95	96	99	99	100	101	103	104	104	104
4/12/78	AM	104	103	101	100	100	99	101	98	96			
6/23/78	PM	196	196	195	194	193	191	192	193	194	196	196	196
6/24/78	AM	198	199	200	199	202	203	203	204	205	206	204	202
	PM	198	196	196	196	195	194	193	193	194	195	197	198
6/25/78	AM	196	198	200	200	200	201	201	202	204	206	205	204
	PM	202	201	198	196	195	195	194	194	196	195	197	196
6/26/78	AM	196	197	199	198	199	201	201	200	203	203	203	202
	PM	202	203	201	200	200	201	200	198	199	200	199	197
6/27/78	AM	196	196	197	197	197	197	199	199	198	198	198	196
	PM	196	196	195	196	196	198	197	198	198	197	198	199
6/28/78	AM	198	196	198	197	195	195	194	195	196	198	200	200
	PM	199	197	198	197	197	198	199	199	199	200	202	201
6/29/78	AM	203	206	206	206	207	208	209	209	209	209	208	209
	PM	209	207	204	204	204	204	202	204	204	203	204	206
6/30/78	AM	207	208	209	208	208	209	209	209	208	208	207	207
	PM	208	206	207	206	205	205	205	205	206	208	209	209
7/01/78	AM	209	209	209	210	211	211	211	212	210	210	208	207
	PM	208	207	207	208	205	206	206	207	209	208	209	210
7/02/78	AM	209	210	212	212	211	212	212	212	210	209	207	205
	PM	206	205	205	206	205	205	206	206	207	210	209	210
7/03/78	AM	210	210	210	209	209	210	209	210	209	209	208	209
	PM	207	207	210	210	210	208	206	204	203	202	202	203
7/04/78	AM	202	201	200	200	200	198	197	196	197	197	196	194
	PM	193	192	192	193	193	193	196	196	197	197	198	200
7/05/78	AM	202	201	202	203	204	204	205	204	205			

Table 23.--Diel measurements of water temperature, specific conductance, pH, and dissolved oxygen at selected sites--Continued

CROOKED CREEK AT MIDDLEBURY CENTER

PH, IN UNITS, AT INDICATED HOURS

DATE		1	2	3	4	5	6	7	8	9	10	11	12
4/20/76	PM		8.18	8.47	8.44	8.55	8.61	8.57	8.54	8.34	8.07	7.77	7.46
4/21/76	AM	7.40	7.18	7.13	7.20	7.17	7.17	7.08	7.25	7.27	7.43	7.52	7.80
	PM	8.02	8.15	8.27	8.47	8.46	8.52	8.38	8.20	8.07	7.80	7.52	7.27
7/22/76	AM	7.15	7.11	7.08	7.04	7.10	7.10	7.03	7.16	7.21	7.24	7.32	7.55
	PM	7.69	7.98	8.08	8.32	8.35	8.40	8.48	8.40	8.25	7.93	7.73	7.44
4/23/76	AM	7.40	7.29	7.23	7.18	7.10	7.18	7.15	7.32	7.43	7.57	7.83	7.78
	PM	8.00	8.32	8.42	8.49	8.52	8.48	8.54	8.27	8.15	7.86	7.67	7.52
4/24/76	AM	7.44	7.25	7.26	7.14	7.07	7.15	7.18	7.31	7.36	7.35	7.44	7.60
	PM	7.70	7.97	8.13	8.18	8.24	8.33	8.27	8.01	7.90	7.70	7.58	7.48
4/25/76	AM	7.42	7.32	7.18	7.16	7.15	7.16	7.27	7.31	7.36	7.33	7.46	7.55
	PM	7.65	7.72	7.70	7.78	7.68	7.71	7.63	7.55	7.46	7.43	7.37	7.27
4/26/76	AM	7.31	7.25	7.27	7.28	7.28	7.28	7.33	7.40	7.61	7.64	7.78	7.79
	PM	7.88	7.98	8.03	8.17	8.13	8.15	8.03	7.94	7.86	7.52	7.47	7.34
4/27/76	AM	7.35	7.42	7.40	7.41	7.40	7.42	7.47	7.49	7.58	7.55		
4/21/77													
	PM					8.80	8.79	8.76	8.66	8.55	8.43	8.23	7.99
4/22/77	AM	7.35	7.06	6.99	6.96	7.06	7.05	7.05	7.27	7.55	7.73	8.03	8.29
	PM	8.50	8.66	8.66	8.83	8.85	8.83	8.65	8.65	8.42	8.25	7.91	7.48
4/23/77	AM	7.06	6.90	6.95	6.93	6.83	6.84	7.02	6.88	7.06	7.16	7.36	7.73
	PM	7.84	8.15	8.24	8.18	8.42	8.22	8.09	7.59	7.31	7.09	7.15	7.16
4/24/77	AM	7.10	7.16	7.14	7.06	7.01	6.90	6.92	6.94	7.07	6.99	7.05	7.23
	PM	7.30	7.23	7.29	7.24	7.07	7.00	7.10	6.96	6.96	7.05	7.07	6.97
4/25/77	AM	7.06	7.05	7.03	6.99	6.96	6.99	7.03	7.10	7.30	7.36	7.55	7.60
	PM	7.74	7.84	7.93	7.92	7.84	7.67	7.48	7.26	7.13	7.06	6.97	6.96
4/26/77	AM	6.96	7.09	7.03	6.89	7.01	6.96	7.04	7.34	7.54	7.75	7.92	8.03
	PM	8.05	8.10	8.07	7.97	7.86	7.71	7.59	7.31	7.12	7.04	6.93	7.01
4/27/77	AM	7.01	7.02	6.95	6.96	6.94	6.95	7.07					
3/23/78	PM			7.03	7.04	7.04	7.06	7.08	7.08	7.09	7.08	7.10	7.10
3/24/78	AM	7.10	7.11	7.10	7.12	7.12	7.12	7.12	7.08	7.07	7.11	7.09	7.09
	PM	7.08	7.08	7.12	7.16	7.14	7.12	7.13	7.15	7.13	7.12	7.15	7.13
3/25/78	AM	7.07	7.05	7.04	7.03	7.00	7.00	7.02	7.05	7.07	7.05	7.03	7.02
	PM	7.07	7.09	7.09	7.10	7.10	7.08	7.08	7.07	7.05			
4/03/78	PM					7.31	7.37	7.37	7.37	7.38	7.35	7.38	7.41
4/04/78	AM	7.42	7.36	7.40	7.37	7.32	7.36	7.34	7.42	7.40	7.47	7.49	7.51
	PM	7.54	7.56	7.58	7.39	7.51	7.44	7.43	7.41	7.42	7.43	7.42	7.41
4/05/78	AM	7.44	7.46	7.43	7.46	7.46	7.44	7.33	7.47	7.53	7.55	7.55	7.53
	PM	7.58	7.58	7.55	7.58	7.59	7.53	7.50	7.46	7.42	7.40	7.36	7.35
4/06/78	AM	7.32	7.35	7.26	7.26	7.16	7.07	7.10	7.14	7.10	7.10	7.06	7.05
	PM	7.01	6.94	6.86	6.86	6.66	6.71	6.60	6.40	6.46	6.45	6.48	6.41
4/07/78	AM	6.36	6.46	6.42	6.33	6.47	6.27	6.45	6.29	6.24	6.50	6.59	6.73
	PM	6.76	6.77	6.83	6.81	6.84	6.80	6.76	6.77	6.68	6.76	6.74	6.75
4/08/78	AM	6.75	6.73	6.84	6.75	6.76	6.76	6.80	6.72	6.92	6.97	7.01	6.99
	PM	7.13	7.15	7.16	7.17	7.17	7.14	7.10	7.02	6.99	7.03	7.01	7.03
4/09/78	AM	7.03	7.07	7.03	7.03	7.03	7.03	7.03	7.16	7.17	7.21	7.25	7.26
	PM	7.27	7.33	7.36	7.36	7.36	7.31	7.23	7.09	7.11	7.05	7.07	7.06
4/10/78	AM	7.09	7.10	7.07	7.07	7.03	7.07	7.07	7.17	7.25	7.28	7.30	7.33
	PM	7.35	7.40	7.43	7.45	7.42	7.43	7.31	7.24	7.16	7.13	7.12	7.13
4/11/78	AM	7.10	7.14	7.12	7.11	7.11	7.10	7.13	7.21	7.30	7.37	7.47	7.55
	PM	7.60	7.66	7.63	7.53	7.40	7.27	7.21	7.18	7.19	7.16	7.15	7.13
4/12/78	AM	7.14	7.20	7.14	7.14	7.13	7.12	7.16	7.26	7.36			
6/23/78	PM	7.53	7.56	7.60	7.63	7.66	7.68	7.73	7.75	7.72	7.67	7.60	7.54
6/24/78	AM	7.50	7.40	7.36	7.32	7.28	7.25	7.25	7.26	7.34	7.43	7.49	7.54
	PM	7.56	7.56	7.53	7.46	7.46	7.50	7.56	7.60	7.60	7.56	7.53	7.49
6/25/78	AM	7.46	7.43	7.36	7.33	7.30	7.25	7.25	7.27	7.30	7.37	7.52	7.49
	PM	7.50	7.56	7.57	7.60	7.64	7.66	7.68	7.69	7.63	7.58	7.54	7.51
6/26/78	AM	7.48	7.45	7.43	7.37	7.34	7.30	7.26	7.26	7.27	7.26	7.25	7.26
	PM	7.28	7.29	7.31	7.36	7.36	7.43	7.46	7.44	7.43	7.41	7.40	7.41
6/27/78	AM	7.41	7.39	7.37	7.34	7.32	7.30	7.26	7.24	7.25	7.32	7.37	7.40
	PM	7.49	7.53	7.55	7.54	7.52	7.53	7.54	7.54	7.54	7.50	7.45	7.37
6/28/78	AM	7.33	7.27	7.24	7.21	7.18	7.17	7.18	7.19	7.23	7.32	7.34	7.40
	PM	7.45	7.51	7.56	7.60	7.66	7.56	7.45	7.42	7.37	7.37	7.39	7.37
6/29/78	AM	7.37	7.36	7.33	7.31	7.26	7.24	7.24	7.24	7.26	7.33	7.36	7.42
	PM	7.46	7.51	7.54	7.54	7.56	7.61	7.63	7.63	7.60	7.56	7.48	7.45
6/30/78	AM	7.42	7.35	7.35	7.35	7.32	7.28	7.28	7.27	7.31	7.34	7.41	7.46
	PM	7.49	7.52	7.56	7.56	7.61	7.63	7.60	7.60	7.57	7.55	7.48	7.45
7/01/78	AM	7.44	7.43	7.41	7.36	7.34	7.28	7.29	7.30	7.35	7.36	7.46	7.53
	PM	7.63	7.68	7.71	7.74	7.76	7.75	7.72	7.68	7.65	7.63	7.60	7.58
7/02/78	AM	7.56	7.56	7.54	7.51	7.48	7.44	7.41	7.42	7.43	7.53	7.68	7.74
	PM	7.83	7.89	7.96	8.06	8.04	8.03	8.00	7.96	7.88	7.83	7.78	7.76
7/03/78	AM	7.73	7.72	7.69	7.64	7.56	7.53	7.50	7.47	7.50	7.51	7.46	7.46
	PM	7.47	7.48	7.49	7.52	7.53	7.56	7.60	7.56	7.55	7.55	7.53	7.52
7/04/78	AM	7.51	7.47	7.44	7.38	7.36	7.28	7.29	7.27	7.32	7.37	7.43	7.51
	PM	7.63	7.68	7.78	7.90	8.01	8.04	8.34	8.24	8.25	8.20	8.13	7.97
7/05/78	AM	7.87	7.77	7.68	7.59	7.53	7.45	7.41	7.36	7.46			

Table 23.—Diel measurements of water temperature, specific conductance, pH, and dissolved oxygen at selected sites--Continued

CROOKED CREEK AT MIDDLEBURY CENTER

DISSOLVED OXYGEN, IN MILLIGRAMS PER LITER, AT INDICATED HOURS

DATE		1	2	3	4	5	6	7	8	9	10	11	12
4/20/76	PM		11.87	11.80	11.76	11.58	11.13	10.35	9.46	8.68	8.26	7.63	7.48
4/21/76	AM	7.30	7.20	7.40	7.46	7.60	7.82	8.14	8.46	9.41	10.11	10.65	11.23
	PM	11.59	12.03	12.06	11.73	11.53	10.73	10.20	9.08	8.32	7.47	7.06	6.77
4/22/76	AM	6.74	6.73	6.66	6.73	6.93	7.05	7.43	7.58	8.25	8.80	9.46	10.00
	PM	10.43	10.94	11.03	11.12	10.99	10.82	10.14	9.40	8.66	8.03	7.70	7.58
4/23/76	AM	7.30	7.35	7.35	7.46	7.70	7.80	8.17	8.94	9.46	10.24	10.93	11.20
	PM	11.52	11.96	11.82	11.67	11.38	10.83	9.98	9.07	8.42	7.81	7.64	7.40
4/24/76	AM	7.38	7.44	7.35	7.76	7.77	8.27	8.80	9.39	9.70	10.36	10.76	11.05
	PM	11.50	11.92	12.07	12.12	11.95	11.92	11.15	10.57	10.13	9.63	9.23	8.92
4/25/76	AM	8.65	8.60	8.63	8.77	8.96	9.05	9.26	9.75	9.75	10.20	10.46	10.70
	PM	10.96	10.69	10.58	10.66	10.57	10.45	9.98	9.73	9.50	9.23	9.25	9.15
4/26/76	AM	9.36	9.40	9.40	9.60	9.76	9.79	10.21	10.67	11.28	11.24	11.64	11.56
	PM	11.92	12.04	12.12	12.23	12.20	11.98	11.65	11.33	11.02	10.74	10.76	10.96
4/27/76	AM	11.05	11.05	11.25	11.24	11.16	11.53	11.57	12.07	12.36	12.44		
4/21/77	PM					11.95	11.29	10.09	9.31	8.61	8.02	7.67	7.59
4/22/77	AM	7.56	7.51	7.80	7.80	8.00	8.38	8.79	9.59	9.37	10.00	11.71	12.14
	PM	12.38	12.19	11.93	11.39	10.79	10.18	9.44	9.06	8.49	7.99	7.87	7.69
4/23/77	AM	7.45	7.40	7.50	7.70	7.76	8.00	8.36	8.59	9.08	9.71	10.47	11.01
	PM	11.21	11.21	11.28	11.06	10.69	10.11	9.72	9.19	9.00	8.89	9.13	9.31
4/24/77	AM	9.33	9.51	9.59	9.62	9.78	9.69	10.03	10.00	10.00	10.16	10.33	10.40
	PM	10.57	10.52	10.23	10.11	10.16	10.03	10.03	9.99	10.00	10.07	10.18	10.31
4/25/77	AM	10.38	10.48	10.33	10.33	10.60	10.70	10.80	11.09	11.04	11.31	11.51	11.75
	PM	11.60	11.58	11.30	11.19	10.85	10.93	10.60	10.22	10.22	10.21	10.44	10.42
4/26/77	AM	10.55	10.39	10.47	10.64	10.67	10.84	11.27	11.90	12.20	12.11	11.73	11.81
	PM	11.82	11.71	11.10	10.89	10.90	11.11	11.01	10.46	10.28	10.17	10.30	10.21
4/27/77	AM	10.31	10.63	10.57	10.70	10.57	10.77	11.30					
3/23/78	PM			12.10	12.30	12.47	12.82	13.00	12.92	13.02	13.10	13.10	13.12
3/24/78	AM	13.12	13.12	13.10	13.15	13.15	13.12	13.08	13.12	13.32	13.40	13.30	13.10
	PM	12.88	12.55	12.38	12.30	12.20	12.30	12.52	12.60	12.70	12.93	13.12	13.20
3/25/78	AM	13.40	13.75	13.70	13.68	13.80	13.80	13.80	13.80	13.80	13.80	13.70	13.60
	PM	13.60	13.48	13.30	13.33	13.43	13.52	13.60	13.60	13.60			
4/03/78	PM					13.53	13.48	13.43	13.42	13.40	13.40	13.33	13.35
4/04/78	AM	13.35	13.32	13.30	13.30	13.22	13.22	13.27	13.28	13.30	13.30	13.22	13.24
	PM	12.88	12.60	12.30	11.93	11.85	11.80	11.75	11.85	11.97	12.05	12.10	12.15
4/05/78	AM	12.10	12.30	12.25	12.23	12.20	12.27	12.33	12.37	12.48	12.50	12.55	12.55
	PM	12.52	12.50	12.43	12.30	12.32	12.27	12.20	12.15	12.28	12.30	12.33	12.55
4/06/78	AM	12.70	12.75	12.92	12.90	13.08	13.14	13.32	13.45	13.50	13.38	13.07	12.72
	PM	12.55	12.35	12.20	12.10	12.07	12.07	12.03	12.03	12.15	12.18	12.28	12.52
4/07/78	AM	12.55	12.62	12.68	12.65	12.55	12.68	12.68	12.70	12.76	12.80	12.60	12.30
	PM	11.86	11.54	11.29	11.08	11.06	11.07	11.15	11.15	11.37	11.53	11.60	11.88
4/08/78	AM	12.15	12.30	12.48	12.62	12.68	12.75	12.88	13.05	13.20	13.15	12.96	12.85
	PM	12.75	12.53	12.20	12.12	12.05	12.13	12.15	12.25	12.23	12.35	12.40	12.72
4/09/78	AM	12.90	12.95	13.08	13.30	13.40	13.52	13.68	13.86	13.93	13.92	13.62	13.35
	PM	13.07	12.65	12.35	12.30	12.28	12.13	12.10	12.12	12.30	12.48	12.52	12.70
4/10/78	AM	12.75	12.85	12.88	12.95	13.00	13.13	13.35	13.55	13.75	13.70	13.55	13.28
	PM	13.18	12.98	12.82	12.50	12.07	11.95	11.90	11.70	11.68	11.65	11.85	12.05
4/11/78	AM	12.15	12.10	12.12	12.20	12.23	12.20	12.28	12.50	12.70	12.75	12.72	12.50
	PM	12.15	11.87	11.60	11.20	10.97	10.95	11.05	11.13	11.30	11.75	12.03	12.12
4/12/78	AM	12.13	12.34	12.47	12.55	12.65	12.88	13.10	13.38	13.33			
6/23/78	PM	9.20	9.37	9.45	9.45	9.36	9.27	9.13	8.81	8.40	8.09	7.68	7.50
6/24/78	AM	7.25	7.11	6.95	6.87	6.87	6.88	7.04	7.26	7.45	7.77	8.10	8.44
	PM	8.79	9.01	9.03	8.69	8.63	8.70	8.69	8.62	8.35	8.00	7.71	7.42
6/25/78	AM	7.15	6.96	6.79	6.62	6.60	6.60	6.63	6.77	7.07	7.31	7.57	7.84
	PM	8.27	8.56	8.80	8.98	9.11	9.15	7.03	8.74	8.38	8.10	7.75	7.53
6/26/78	AM	7.40	7.17	6.90	6.72	6.63	6.60	6.61	6.63	6.68	6.80	7.07	7.22
	PM	7.45	7.58	7.79	8.00	8.12	8.30	8.34	8.23	8.10	7.94	7.85	7.72
6/27/78	AM	7.62	7.61	7.50	7.24	7.10	6.90	6.90	6.98	7.12	7.33	7.64	7.98
	PM	8.27	8.38	8.38	8.29	8.08	7.93	7.85	7.72	7.50	7.11	6.67	6.42
6/28/78	AM	6.18	5.92	5.85	5.80	5.82	5.87	6.00	6.14	6.32	6.50	6.79	7.16
	PM	7.67	8.04	8.11	8.37	8.25	7.74	7.09	6.78	6.65	6.67	6.65	6.60
6/29/78	AM	6.42	6.33	6.20	6.13	6.04	6.05	6.06	6.33	6.62	6.83	7.11	7.34
	PM	7.62	7.83	7.88	8.06	8.13	8.15	8.12	7.93	7.64	7.25	7.00	6.72
6/30/78	AM	6.64	6.43	6.35	6.20	6.11	6.08	6.10	6.29	6.51	6.80	7.12	7.37
	PM	7.59	7.70	7.83	7.94	7.96	8.03	7.99	7.88	7.70	7.43	7.18	7.00
7/01/78	AM	6.85	6.72	6.60	6.55	6.43	6.41	6.38	6.56	6.75	7.08	7.50	8.00
	PM	8.32	8.54	8.75	8.89	8.92	8.92	8.87	8.69	8.38	8.15	7.99	7.86
7/02/78	AM	7.65	7.58	7.43	7.35	7.20	7.12	7.08	7.15	7.52	7.90	8.32	8.78
	PM	9.06	9.30	9.54	9.72	9.71	9.62	9.43	9.23	8.98	8.67	8.40	8.15
7/03/78	AM	7.92	7.73	7.60	7.43	7.25	7.11	7.00	7.12	7.44	7.57	7.60	7.62
	PM	7.63	7.80	7.85	8.04	8.11	8.50	8.61	8.51	8.36	8.30	8.20	8.10
7/04/78	AM	7.93	7.75	7.55	7.38	7.30	7.18	7.18	7.21	7.56	7.86	8.25	8.63
	PM	9.08	9.42	9.57	9.80	9.90	9.88	9.90	9.87	9.52	9.13	8.88	8.57
7/05/78	AM	8.11	7.87	7.68	7.45	7.33	7.15	7.10	7.27	7.83			

Table 23.--Diel measurements of water temperature, specific conductance, pH, and dissolved oxygen at selected sites--Continued

COWANESQUE RIVER AT NELSON

TEMPERATURE, IN DEGREES CELSIUS, AT INDICATED HOURS

DATE		1	2	3	4	5	6	7	8	9	10	11	12
3/07/77	PM				2.0	2.0	2.1	2.1	2.0	1.9	1.7	1.5	1.4
3/08/77	AM	1.4	1.2	0.9	0.7	0.5	0.2						
4/14/77	PM			16.1	16.2	16.1	15.7	15.2	14.7	14.1	13.3	12.7	12.1
4/15/77	AM	11.5	10.9	10.4	9.8	9.3	8.8	8.5	8.6	9.1	9.9	10.9	12.0
	PM	13.0	14.0	14.7	15.0	15.0	14.8	14.3	13.8	13.2	12.6	12.0	11.5
4/16/77	AM	11.0	10.5	10.0	9.5	9.0	8.6	8.3	8.5	9.0	9.7	10.7	11.8
	PM	12.8	13.7	15.3	15.8	15.7	15.4	15.2	13.7	13.1	12.5	12.0	11.4
4/17/77	AM	10.9	10.5	10.0	9.5	9.1	8.7	8.5	8.8	9.3	10.2	11.2	12.3
	PM	13.5	14.5	15.3	15.8	16.0	15.8	15.4	15.0	14.4	13.8	13.1	12.4
4/18/77	AM	11.8	11.2	10.7	10.2	9.7	9.3	9.0	9.3	10.0	10.8	11.7	12.3
	PM	12.8	13.2	13.7	14.1	14.2	13.8	13.6	13.2	12.9	12.6	12.1	11.8
4/19/77	AM	11.5	11.2	10.9	10.7	10.5	10.4	10.3	10.4	10.7	10.8	11.6	12.4
	PM	13.6	14.6	15.3	15.8	16.1	16.3	16.3	16.2	15.8	15.3	14.9	14.5
4/20/77	AM	14.2	13.8	13.5	13.2	12.9	12.7	12.6	12.8	13.0	13.6	14.4	15.2
	PM	16.0	16.5	16.6	17.1	17.3	17.2	16.8	16.4	16.1	15.7	15.3	14.7
4/21/77	AM	14.4	14.0	13.7	13.4	13.2	13.0	12.9	12.9	13.2	14.0		

SPECIFIC CONDUCTANCE, IN MICROMHOS PER CENTIMETER AT 25 DEGREES CELSIUS, AT INDICATED HOURS

DATE		1	2	3	4	5	6	7	8	9	10	11	12
3/07/77	PM				140	123	120	121	124	128	150	153	152
3/08/77	AM	151	145	143	139	140	137						
4/14/77	PM			200	192	204	194	196	196	197	204	206	209
4/15/77	AM	205	209	209	217	225	233	232	226	232	229	219	220
	PM	211	207	211	211	211	205	201	210	207	209	214	211
4/16/77	AM	212	228	229	232	232	221	224	223	220	219	212	212
	PM	211	215	209	205	211	207	206	213	214	212	212	218
4/17/77	AM	213	217	223	217	225	220	225	223	223	213	215	209
	PM	219	219	207	210	217	218	208	216	212	209	211	218
4/18/77	AM	221	221	223	224	222	221	222	216	215	213	218	218
	PM	208	205	214	206	208	210	210	212	211	211	210	215
4/19/77	AM	217	212	213	217	213	211	213	219	210	213	208	212
	PM	212	211	203	207	206	207	198	197	204	207	207	210
4/20/77	AM	203	204	206	211	213	213	206	215	211	204	212	211
	PM	208	212	203	208	209	213	204	213	203	203	209	212
4/21/77	AM	217	221	222	222	223	226	222	225	229	230		

pH, IN UNITS, AT INDICATED HOURS

DATE		1	2	3	4	5	6	7	8	9	10	11	12
3/07/77	PM				6.90	6.26	6.30	6.31	6.29	6.22	6.38	6.40	6.39
3/08/77	AM	6.38	6.38	6.44	6.37	6.38	6.35						
4/14/77	PM			9.09	9.05	9.06	8.90	9.10	8.99	8.78	8.74	8.57	8.20
4/15/77	AM	7.87	7.55	7.27	7.20	7.14	7.25	7.26	7.35	7.45	7.75	8.00	8.33
	PM	8.65	8.75	8.85	9.00	9.02	9.10	9.02	8.99	9.01	8.89	8.67	8.39
4/16/77	AM	7.94	7.69	7.46	7.35	7.26	7.34	7.28	7.45	7.49	7.67	8.00	8.39
	PM	8.65	8.80	8.86	8.95	9.07	9.05	9.05	9.06	9.01	8.95	8.85	8.53
4/17/77	AM	8.28	7.77	7.63	7.50	7.37	7.43	7.39	7.55	7.62	7.85	8.11	8.29
	PM	8.62	8.70	8.85	8.91	8.91	8.99	9.05	9.03	9.01	8.90	8.80	8.49
4/18/77	AM	8.19	7.75	7.53	7.41	7.32	7.32	7.32	7.50	7.51	7.75	7.91	8.20
	PM	8.45	8.67	8.82	8.94	9.03	9.03	8.94	8.94	8.89	8.82	8.73	8.50
4/19/77	AM	8.29	7.78	7.60	7.35	7.20	7.24	7.22	7.35	7.30	7.43	7.60	8.01
	PM	8.19	8.39	8.52	8.64	8.64	8.73	8.77	8.71	8.68	8.68	8.46	8.24
4/20/77	AM	7.81	7.60	7.29	7.21	7.21	7.29	7.14	7.31	7.48	7.60	7.85	8.15
	PM	8.23	8.37	8.52	8.50	8.64	8.59	8.57	8.57	8.52	8.49	8.37	8.30
4/21/77	AM	8.00	7.63	7.35	7.33	7.00	7.06	7.07	7.15	7.33	7.37		

DISSOLVED OXYGEN, IN MILLIGRAMS PER LITER, AT INDICATED HOURS

DATE		1	2	3	4	5	6	7	8	9	10	11	12
3/07/77	PM				13.00	13.20	13.10	13.08	12.77	12.62	12.56	12.54	12.64
3/08/77	AM	12.58	12.66	12.66	12.54	12.50	12.74						
4/14/77	PM			12.94	12.97	12.55	11.98	11.34	10.90	10.35	9.80	9.60	9.36
4/15/77	AM	9.38	9.44	9.55	9.62	9.79	10.10	10.60	11.35	11.80	12.57	13.08	13.46
	PM	11.50	11.57	11.46	11.34	12.87	12.36	11.59	11.25	10.65	10.13	9.83	9.51
4/16/77	AM	9.48	9.56	9.66	9.81	9.95	10.10	10.83	11.33	11.83	12.45	13.25	13.64
	PM	13.75	13.97	13.90	13.78	13.17	12.50	11.65	11.14	10.70	10.34	9.78	9.74
4/17/77	AM	9.64	9.52	9.66	9.72	9.72	10.24	10.67	11.35	11.76	12.50	12.86	13.25
	PM	13.59	13.53	13.35	13.04	12.66	12.00	11.50	10.90	10.44	9.91	9.58	9.32
4/18/77	AM	9.09	9.09	9.39	9.36	9.51	10.00	10 56	11.10	11.69	12.10	12.79	13.10
	PM	13.80	13.18	13.21	13.05	12.92	12.10	11.67	11.09	10.79	10.40	9.85	9.56
4/19/77	AM	9.41	9.20	9.35	9.31	9.39	9.50	10.03	10.40	11.00	11.41	11.89	12.36
	PM	12.85	12.83	13.13	12.74	12.02	11.50	10.85	10.28	9.61	9.22	8.91	8.59
4/20/77	AM	8.51	8.31	8.10	8.33	8.41	8.94	9.49	10.08	10.68	11.25	11.90	12.20
	PM	12.49	12.41	12.26	12.21	11.75	11.20	10.35	9.98	9.56	9.20	8.84	8.50
4/21/77	AM	8.31	8.10	8.15	8.20	8.34	8.66	9.11	9.46	10.15	10.73		

Table 24.--Water-quality data collected from September 1973 to September 1978

01516350 - TIOGA RIVER NEAR MANSFIELD, PA.

WATER QUALITY DATA, WATER YEAR OCTOBER 1974 TO SEPTEMBER 1975

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	ACIDITY TOTAL HEATED (MG/L AS H)	ACIDITY (MG/L AS CACO3)
MAY									
14...	0830	267	163	5.6	10.5	10.4	93	.4	14
JUN									
10...	1145	269	211	4.4	14.0	9.7	93	.4	20
JUL									
09...	0700	55	356	3.7	21.0	7.8	87	.9	47
AUG									
06...	0915	28	608	3.0	21.0	8.4	93	1.8	83
SEP									
11...	0830	37	427	3.6	13.0	10.0	94	1.2	56

DATE	BICAR-BONATE (MG/L AS HCO3)	CAR-BONATE (MG/L AS CO3)	ALKA-LINITY (MG/L AS CACO3)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)
MAY									
14...	2	0	3	8.0	50	3.0	.27	.01	.28
JUN									
10...	1	0	1	64	43	3.0	.59	--	--
JUL									
09...	0	0	0	.0	140	6.0	.20	--	--
AUG									
06...	0	0	0	.0	250	8.0	.35	.01	.36
SEP									
11...	0	0	0	.0	190	8.5	.38	--	--

DATE	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, ORTHO, TOTAL (MG/L AS P)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT DIS-CHARGE, SUS-PENDED (T/DAY)
MAY								
14...	.03	.10	.13	.41	.06	.00	24	17
JUN								
10...	.01	.16	.17	.76	.01	.01	5	3.6
JUL								
09...	.04	.07	.11	.31	.01	.00	E0	--
AUG								
06...	.07	.07	.14	.50	.06	.01	E0	--
SEP								
11...	.05	.06	.11	.49	.01	.00	E0	--

Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01516350 - TIOGA RIVER NEAR MANSFIELD, PA.

WATER QUALITY DATA, WATER YEAR OCTOBER 1974 TO SEPTEMBER 1975

DATE	TIME	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	ARSENIC DISSOLVED (UG/L AS AS)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CADMIUM DISSOLVED (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	CHROMIUM, DISSOLVED (UG/L AS CR)
MAY									
14...	0830	--	810	--	1	--	0	--	10
JUN									
10...	1145	--	2900	--	0	--	0	--	<10
JUL									
09...	0700	4200	4500	0	2	0	1	0	0
AUG									
06...	0915	--	9200	--	--	--	--	--	--
SEP									
11...	0830	6800	8900	--	--	--	--	--	--

DATE	COBALT, TOTAL RECOVERABLE (UG/L AS CO)	COBALT, DISSOLVED (UG/L AS CO)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	COPPER, DISSOLVED (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	LEAD, DISSOLVED (UG/L AS PB)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)
MAY									
14...	--	19	--	10	--	220	--	0	--
JUN									
10...	--	37	--	20	--	1200	--	1	--
JUL									
09...	52	64	20	30	530	430	6	5	4500
AUG									
06...	--	--	--	--	--	670	--	--	--
SEP									
11...	--	--	--	--	850	800	--	--	5800

DATE	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	MERCURY DISSOLVED (UG/L AS HG)	SELENIUM, TOTAL (UG/L AS SE)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	SILVER, DISSOLVED (UG/L AS AG)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	ZINC, DISSOLVED (UG/L AS ZN)
MAY									
14...	1500	--	<.5	--	1	--	0	--	200
JUN									
10...	2300	--	<.5	--	0	--	0	--	310
JUL									
09...	4500	<.5	<.5	1	0	0	0	630	600
AUG									
06...	7300	--	--	--	--	--	--	--	950
SEP									
11...	5900	--	--	--	--	--	--	1100	1100

Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01516350 TIOGA RIVER NEAR MANSFIELD, PA.

WATER QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	ACIDITY TOTAL HEATED (MG/L AS H)	ACIDITY (MG/L AS CACO3)
OCT									
07...	0800	156	338	4.0	9.5	10.4	91	.8	48
NOV									
11...	0740	242	162	5.1	8.0	11.0	92	.2	12
DEC									
10...	0830	699	118	5.6	1.5	13.0	93	.2	9.0
JAN									
07...	0800	112	274	3.6	.0	13.4	92	.7	39
FEB									
04...	1445	269	231	4.5	.0	13.2	90	.6	30
MAR									
08...	1430	417	202	4.2	4.5	11.8	91	.4	24
APR									
05...	1430	306	178	4.4	9.0	10.6	91	.4	18

DATE	BICAR-BONATE (MG/L AS HCO3)	CAR-BONATE (MG/L AS CO3)	ALKA-LINITY (MG/L AS CACO3)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)
OCT									
07...	0	0	0	.0	130	4.0	.47	--	--
NOV									
11...	2	0	2	25	60	4.0	.32	--	--
DEC									
10...	13	0	4	52	38	4.2	.36	.01	.37
JAN									
07...	0	0	0	.0	110	4.0	--	--	--
FEB									
04...	0	0	0	.0	100	4.5	--	--	--
MAR									
08...	0	0	0	.0	79	3.0	.72	--	--
APR									
05...	0	0	0	.0	68	4.2	--	--	--

DATE	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, ORTHO, TOTAL (MG/L AS P)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT DIS-CHARGE, SUS-PENDED (T/DAY)
OCT								
07...	.07	.08	.15	.62	.04	.02	51	21
NOV								
11...	.01	.27	.28	.60	.07	.05	203	133
DEC								
10...	.04	.43	.47	.84	.22	.01	389	734
JAN								
07...	--	--	--	--	--	--	E0	--
FEB								
04...	--	--	--	--	--	--	56	41
MAR								
08...	.05	.11	.16	.88	.01	.01	22	25
APR								
05...	--	--	--	--	--	--	15	12

DATE	TIME	ALUM-INUM, TOTAL RECOV-ERABLE (UG/L AS AL)	ALUM-INUM, DIS-SOLVED (UG/L AS AL)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE)	IRON, DIS-SOLVED (UG/L AS FE)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN)	ZINC, DIS-SOLVED (UG/L AS ZN)
OCT									
07...	0800	6500	5000	3400	630	5000	5000	520	520
NOV									
11...	0740	3700	430	6500	110	1400	1800	250	230
DEC									
10...	0830	6000	60	15000	80	960	850	150	90

Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01516350 - TIOGA RIVER NEAR MANSFIELD, PA.

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE, (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	HARD-NESS (MG/L AS CACO3)	HARD-NESS, NONCAR-BONATE (MG/L CACO3)	ACIDITY TOTAL HEATED (MG/L AS H)
FEB											
09...	1700	167	274	4.2	.0	13.8	95	0	86	86	.7

DATE	ACIDITY (MG/L AS CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	BICAR-BONATE (MG/L AS HCO3)	CAR-BONATE (MG/L AS CO3)	ALKA-LINITY (MG/L AS CACO3)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2)
FEB											
09...	34	18	10	3.3	8	.2	1.2	0	0	0	.0

DATE	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS N)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITRO-GEN, ORGANIC DIS-SOLVED (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC DIS. (MG/L AS N)	PHOS-PHORUS, DIS-SOLVED (MG/L AS P)	SEDI-MENT, SUS-PENDED (MG/L)
FEB										
09...	100	4.7	.65	.00	.65	.08	.21	.29	.00	E15

Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01516820 - T108A RIVER AT LAMBS CREEK, PA.

WATER QUALITY DATA, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	ACIDITY (MG/L AS CACO3)	BICAR-BONATE (MG/L AS HCO3)	CAR-BONATE (MG/L AS CO3)	ALKA-LINITY (MG/L AS CACO3)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2)
SEP												
06...	1100	216	265	4.5	22.0	11.5	130	29	0	0	0	.0

DATE	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, ORTHO, TOTAL (MG/L AS P)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT DIS-CHARGE, SUS-PENDED (T/DAY)
SEP											
06...	106	7.5	1.6	.41	.56	.97	2.6	.29	.11	336	196

WATER QUALITY DATA, WATER YEAR OCTOBER 1973 TO SEPTEMBER 1974

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	ACIDITY TOTAL HEATED (MG/L AS H)	ACIDITY (MG/L AS CACO3)	BICAR-BONATE (MG/L AS HCO3)	CAR-BONATE (MG/L AS CO3)	ALKA-LINITY (MG/L AS CACO3)
OCT												
09...	1430	73	349	4.1	15.5	9.8	97	34	55	0	0	0
NOV												
08...	0910	149	223	4.6	3.0	12.4	92	.5	24	0	0	0
DEC												
13...	1145	392	208	4.8	1.5	13.1	94	.4	26	0	0	0
JAN												
10...	1015	--	250	4.6	.0	14.0	96	.6	22	0	0	0
FEB												
13...	1315	--	207	4.6	.5	--	--	.4	24	1	0	0
MAR												
13...	1315	--	173	4.2	1.0	13.4	94	.4	17	0	0	0
APR												
02...	1130	1250	141	5.9	3.0	12.8	95	.3	24	19	0	--
MAY												
01...	1215	285	172	5.1	14.0	9.9	96	.2	33	1	0	--
JUN												
12...	1230	96	223	4.6	18.5	9.4	100	.2	50	1	0	0
JUL												
17...	1630	40	416	3.4	26.0	7.6	93	1.0	160	0	0	0
AUG												
14...	1245	29	570	3.5	26.0	7.4	90	1.6	78	0	0	0
SEP												
12...	1230	29	587	3.6	22.0	8.8	100	2.0	89	0	0	0

DATE	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, ORTHO, TOTAL (MG/L AS P)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT DIS-CHARGE, SUS-PENDED (T/DAY)
OCT												
09...	.0	134	8.5	.23	.05	.31	.36	.59	.04	.04	4	.79
NOV												
08...	.0	98	4.0	.29	.07	.17	.24	.53	.03	.02	16	6.4
DEC												
13...	.0	76	2.5	.59	.14	.27	.41	1.0	.10	.10	47	50
JAN												
10...	.0	71	7.3	.80	.13	.15	.28	1.1	.03	.01	14	--
FEB												
13...	40	82	6.5	.70	.13	.31	.44	1.2	.04	.01	42	--
MAR												
13...	.0	61	4.5	.72	.14	.17	.31	1.0	.11	.10	23	--
APR												
02...	38	35	5.0	1.0	.05	.51	.56	1.6	.20	.09	153	516
MAY												
01...	13	66	5.6	.40	.12	.20	.32	.72	.04	.02	20	15
JUN												
12...	40	106	5.5	.57	.17	.23	.40	.97	.03	.01	14	3.6
JUL												
17...	.0	143	10	.23	.10	.14	.24	.47	.02	.00	1	.11
AUG												
14...	.0	256	8.0	.34	.18	.23	.41	.75	.04	.01	2	.16
SEP												
12...	.0	118	10	.50	.12	.10	.22	.72	.03	.01	60	--

Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01516820 - TIOGA RIVER AT LAMBS CREEK, PA.

WATER QUALITY DATA, WATER YEAR OCTOBER 1973 TO SEPTEMBER 1974

DATE	TIME	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	COBALT, TOTAL RECOVERABLE (UG/L AS CO)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)
FEB								
13...	1315	--	--	--	--	--	--	--
MAR								
13...	1315	--	--	--	--	--	--	--
APR								
02...	1130	--	--	--	--	--	--	--
MAY								
01...	1215	2300	1	1	0	28	30	2100
JUN								
12...	1230	20	2	0	10	45	20	1000
JUL								
17...	1630	3500	<1	1	0	74	40	1400
AUG								
14...	1245	12000	0	1	<10	110	40	500
SEP								
12...	1230	5500	1	2	10	140	50	1100

DATE	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	SELENIUM, TOTAL (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)
FEB							
13...	120	--	--	--	--	--	--
MAR							
13...	1200	--	--	--	--	--	--
APR							
02...	70	--	--	--	--	--	--
MAY							
01...	--	--	1400	<.5	0	0	550
JUN							
12...	--	3	2700	<.5	1	1	360
JUL							
17...	--	3	4500	<.5	1	0	640
AUG							
14...	--	6	8400	<.5	<2	0	1300
SEP							
12...	--	7	8000	<.5	3	1	1300

WATER QUALITY DATA, WATER YEAR OCTOBER 1974 TO SEPTEMBER 1975

DATE	TIME	STREAMFLOW, INSTANTANEOUS (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	ACIDITY TOTAL HEATED (MG/L AS H)	ACIDITY (MG/L AS CACO3)
OCT									
10...	1350	33	457	3.8	12.0	10.4	96	1.1	58
NOV									
07...	0830	136	197	6.5	6.0	11.8	99	.0	12
DEC									
09...	1210	1500	109	5.9	2.5	12.8	94	.1	16
JAN									
14...	1245	492	199	3.6	.0	13.2	90	.4	27
FEB									
03...	1230	180	274	3.9	.5	12.6	88	.6	50
MAR									
05...	1215	228	256	4.3	1.0	12.8	90	.6	55
APR									
01...	1200	231	185	4.2	6.0	12.0	96	.3	47
MAY									
14...	1115	376	161	6.6	13.5	9.8	93	.2	7.0
JUN									
10...	1300	291	195	5.1	16.0	9.0	90	.1	12
JUL									
09...	0845	65	293	4.3	22.0	8.8	93	.6	47
AUG									
06...	1030	32	512	3.3	21.0	8.2	91	1.4	68
SEP									
11...	0930	40	380	4.6	15.0	9.7	95	.8	30

Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01516820 - TIOGA RIVER AT LAMBS CREEK, PA.

WATER QUALITY DATA, WATER YEAR OCTOBER 1974 TO SEPTEMBER 1975

DATE	BICARBONATE (MG/L AS HCO3)	CARBONATE (MG/L AS CO3)	ALKALINITY (MG/L AS CACO3)	CARBON DIOXIDE DISSOLVED (MG/L AS CO2)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	NITROGEN, NITRATE TOTAL (MG/L AS N)	NITROGEN, NITRITE TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)
OCT									
10...	0	0	0	.0	188	9.0	.29	--	--
NOV									
07...	12	0	10	6.1	81	6.5	.32	--	--
DEC									
09...	8	0	11	16	25	2.0	.68	--	--
JAN									
14...	1	0	0	402	84	5.0	.54	--	--
FEB									
03...	0	0	0	.0	99	5.5	.68	--	--
MAR									
05...	0	0	0	.0	120	5.0	.86	--	--
APR									
01...	0	0	0	.0	72	5.0	.72	--	--
MAY									
14...	6	0	6	2.4	53	4.0	.29	.01	.30
JUN									
10...	2	0	2	25	73	3.0	.63	--	--
JUL									
09...	0	0	0	.0	130	7.0	.18	--	--
AUG									
06...	0	0	0	.0	230	10	.31	.01	.32
SEP									
11...	0	0	1	.0	170	10	.25	--	--

DATE	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHORUS, ORTHO, TOTAL (MG/L AS P)	SEDIMENT, SUSPENDED (MG/L)	SEDIMENT DISCHARGE, SUSPENDED (T/DAY)
OCT								
10...	.19	.10	.29	.58	.08	.07	E0	--
NOV								
07...	.06	.21	.27	.59	.07	.02	22	8.1
DEC								
09...	.07	.35	.42	1.1	.07	.05	88	356
JAN								
14...	.07	.16	.23	.77	.11	.09	29	39
FEB								
03...	.13	.19	.32	1.0	.03	.02	9	4.4
MAR								
05...	.05	.23	.28	1.1	.05	.03	32	20
APR								
01...	.04	.08	.12	.84	.03	.02	13	8.1
MAY								
14...	.03	.13	.16	.46	.03	.00	26	26
JUN								
10...	.03	.13	.16	.79	.03	.03	11	8.6
JUL								
09...	.06	.10	.16	.34	.01	.00	E0	--
AUG								
06...	.16	.05	.21	.53	.13	.01	E0	--
SEP								
11...	.12	.09	.21	.45	.04	.03	E0	--

Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01516820 - TIOGA RIVER AT LAMBS CREEK, PA.

WATER QUALITY DATA, WATER YEAR OCTOBER 1974 TO SEPTEMBER 1975

DATE	TIME	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	ARSENIC DISSOLVED (UG/L AS AS)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CADMIUM DISSOLVED (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	CHROMIUM, DISSOLVED (UG/L AS CR)
OCT									
10...	1350	5300	--	<1	--	1	--	0	--
NOV									
07...	0830	3100	--	0	--	0	--	0	--
DEC									
09...	1210	1600	--	3	--	1	--	<10	--
JAN									
14...	1245	2700	--	1	--	1	--	0	--
FEB									
03...	1230	210	--	2	--	1	--	0	--
MAR									
05...	1215	--	3000	--	1	--	1	--	0
APR									
01...	1200	--	1800	--	0	--	0	--	0
MAY									
14...	1115	--	50	--	0	--	0	--	<10
JUN									
10...	1300	--	450	--	1	--	0	--	0
JUL									
09...	0845	--	3800	--	0	--	1	--	<10
AUG									
06...	1030	--	8500	--	--	--	--	--	--
SEP									
11...	0930	--	6500	--	--	--	--	--	--

DATE	COBALT, TOTAL RECOVERABLE (UG/L AS CO)	COBALT, DISSOLVED (UG/L AS CO)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	COPPER, DISSOLVED (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	LEAD, DISSOLVED (UG/L AS PB)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)
OCT									
10...	100	--	30	--	1500	--	2	--	6100
NOV									
07...	20	--	10	--	1600	--	3	--	1800
DEC									
09...	10	--	0	--	3400	--	4	--	610
JAN									
14...	40	--	20	--	2800	--	4	--	2000
FEB									
03...	56	--	20	--	3000	--	5	--	3100
MAR									
05...	--	50	--	20	--	1600	--	6	--
APR									
01...	--	29	--	10	--	590	--	0	--
MAY									
14...	--	16	--	10	--	180	--	1	--
JUN									
10...	--	28	--	10	--	670	--	2	--
JUL									
09...	--	54	--	20	--	190	--	7	--
AUG									
06...	--	--	--	--	--	370	--	--	--
SEP									
11...	--	--	--	--	--	270	--	--	--

Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01516820 - TIOGA RIVER AT LAMBS CREEK, PA.

WATER QUALITY DATA, WATER YEAR OCTOBER 1974 TO SEPTEMBER 1975

DATE	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	MERCURY DISSOLVED (UG/L AS HG)	SELENIUM, TOTAL (UG/L AS SE)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	SILVER, DISSOLVED (UG/L AS AG)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	ZINC, DISSOLVED (UG/L AS ZN)
OCT									
10...	--	.8	--	<2	--	0	--	990	--
NOV									
07...	--	<.5	--	0	--	0	--	330	--
DEC									
09...	--	<.5	--	0	--	0	--	90	--
JAN									
14...	--	<.5	--	1	--	0	--	240	--
FEB									
03...	--	<.5	--	0	--	0	--	420	--
MAR									
05...	2300	--	<.5	--	1	--	0	--	390
APR									
01...	1700	--	<.5	--	1	--	0	--	250
MAY									
14...	1200	--	<.5	--	0	--	0	--	150
JUN									
10...	2000	--	<.5	--	1	--	0	--	250
JUL									
09...	3700	--	<.5	--	1	--	0	--	730
AUG									
06...	6700	--	--	--	--	--	--	--	820
SEP									
11...	5100	--	--	--	--	--	--	--	1200

WATER QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	TIME	STREAMFLOW, INSTANTANEOUS (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	ACIDITY TOTAL HEATED (MG/L AS H)	ACIDITY (MG/L AS CACO3)
OCT									
07...	0920	167	298	4.4	10.5	10.4	93	.5	35
NOV									
11...	0920	261	164	6.3	8.0	11.0	92	.1	9.0
DEC									
10...	0940	755	123	6.1	2.0	13.2	9	.1	7.0
JAN									
07...	0900	132	265	4.5	.0	13.8	95	.5	33
FEB									
04...	1545	301	220	5.1	.5	13.4	93	.4	25
MAR									
04...	1530	450	172	5.1	4.5	12.0	93	.3	15
APR									
05...	1530	350	166	4.8	9.0	10.6	91	.2	11
MAY									
05...	1630	147	215	4.9	15.0	9.6	96	.3	17
JUN									
01...	1445	200	197	5.2	16.0	9.6	96	.1	10
JUL									
12...	1525	106	280	4.5	20.0	9.2	100	.6	28
AUG									
10...	1355	112	183	5.3	18.0	9.0	95	.2	11
SEP									
07...	1400	36	567	3.7	18.5	9.7	103	1.4	67

Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01516820 - TIOGA RIVER AT LAMBS CREEK, PA.

WATER QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	BICARBONATE (MG/L AS HCO3)	CARBONATE (MG/L AS CO3)	ALKALINITY (MG/L AS CACO3)	CARBON DIOXIDE DISSOLVED (MG/L AS CO2)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	NITROGEN, NITRATE TOTAL (MG/L AS N)	NITROGEN, NITRITE TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)
OCT									
07...	0	0	0	.0	130	6.0	.66	--	--
NOV									
11...	7	0	5	5.4	57	5.0	.34	--	--
DEC									
10...	20	0	9	25	35	5.0	.37	.03	.40
JAN									
07...	0	0	0	.0	260	5.0	--	--	--
FEB									
04...	0	0	1	.0	92	6.0	--	--	--
MAR									
08...	0	0	1	.0	69	4.5	.70	--	--
APR									
05...	2	0	0	51	57	5.7	--	--	--
MAY									
05...	0	0	1	.0	81	3.8	--	--	--
JUN									
01...	4	0	2	40	75	5.1	.42	.01	.43
JUL									
12...	0	0	0	.0	140	5.0	--	--	--
AUG									
10...	3	0	2	24	71	3.2	--	--	--
SEP									
07...	0	0	0	.0	240	6.8	.35	.01	.36

DATE	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHORUS, ORTHO, TOTAL (MG/L AS P)	ALGAL GROWTH POTENTIAL, BOTTLE TEST (MG/L)	SEDIMENT, SUSPENDED (MG/L)	SEDIMENT DISCHARGE, SUSPENDED (T/DAY)
OCT									
07...	.09	.15	.24	.90	.05	.02	--	49	22
NOV									
11...	.02	.26	.28	.62	.07	.06	--	134	94
DEC									
10...	.05	.40	.45	.85	.21	.04	--	300	612
JAN									
07...	--	--	--	--	--	--	--	E0	--
FEB									
04...	--	--	--	--	--	--	--	51	41
MAR									
08...	.09	.16	.25	.95	.02	.02	--	E0	--
APR									
05...	--	--	--	--	--	--	.0	16	15
MAY									
05...	--	--	--	--	--	--	.0	11	4.4
JUN									
01...	.04	.16	.20	.63	.06	.01	--	17	9.2
JUL									
12...	--	--	--	--	--	--	--	E0	--
AUG									
10...	--	--	--	--	--	--	--	27	23
SEP									
07...	.17	.08	.25	.61	.03	.01	--	E0	--

Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01516820 - TIOGA RIVER AT LAMBS CREEK, PA.

WATER QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	TIME	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC DISSOLVED (UG/L AS AS)	CADMIUM DISSOLVED (UG/L AS CD)	CHROMIUM, DISSOLVED (UG/L AS CR)	COBALT, DISSOLVED (UG/L AS CO)	COPPER, DISSOLVED (UG/L AS CU)
OCT							
07...	0920	3600	--	--	--	--	--
DEC							
10...	0940	40	0	2	0	12	0

DATE	IRON, DISSOLVED (UG/L AS FE)	LEAD, DISSOLVED (UG/L AS PB)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY DISSOLVED (UG/L AS HG)	SILVER, DISSOLVED (UG/L AS AG)	ZINC, DISSOLVED (UG/L AS ZN)
OCT						
07...	220	--	4500	--	--	450
DEC						
10...	50	4	710	<.5	0	60

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	STREAMFLOW, INSTANTANEOUS (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	ACIDITY TOTAL HEATED (MG/L AS H)	ACIDITY (MG/L AS CACO3)	BICARBONATE (MG/L AS HCO3)	CARBONATE (MG/L AS CO3)
OCT											
06...	1600	35	488	4.4	16.0	9.8	98	1.0	49	0	0
NOV											
09...	1345	165	243	5.0	1.5	13.2	94	.5	25	2	0
DEC											
14...	1000	E118	233	6.0	.0	13.6	93	.3	16	6	0
JAN											
12...	1100	E54	338	4.6	.0	12.6	86	1.6	78	1	0
FEB											
08...	1045	E34	414	4.6	.0	13.2	90	1.1	57	1	0
MAR											
07...	0900	521	159	4.7	.5	13.5	94	.3	16	1	0
APR											
13...	0930	225	235	4.6	10.0	10.8	96	.8	42	1	0
MAY											
02...	0945	205	214	3.8	11.5	10.3	94	.9	47	0	0
JUN											
09...	1020	51	397	4.3	13.0	10.4	98	.9	47	0	0
JUL											
06...	0930	65	428	4.0	22.5	8.4	96	1.1	56	0	0
AUG											
08...	0920	43	385	4.5	22.5	8.6	100	1.2	58	0	0
SEP											
15...	1000	40	430	4.8	14.0	10.0	96	1.0	41	2	0

Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01516820 - TIOGA RIVER AT LAMBS CREEK, PA.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	ALKALINITY (MG/L AS CACO3)	CARBON DIOXIDE DISSOLVED (MG/L AS CO2)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	NITROGEN, NITRATE TOTAL (MG/L AS N)	NITROGEN, NITRATE DISSOLVED (MG/L AS N)	NITROGEN, NITRITE TOTAL (MG/L AS N)	NITROGEN, NITRITE DISSOLVED (MG/L AS N)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)
OCT											
06...	0	.0	210	11	--	--	--	--	--	--	--
NOV											
09...	2	32	86	4.6	--	--	--	--	--	--	--
DEC											
14...	5	9.6	86	9.2	.66	--	.01	--	.67	--	.14
JAN											
12...	1	40	150	8.6	--	--	--	--	--	--	--
FEB											
08...	1	40	190	8.3	--	--	--	--	--	--	--
MAR											
07...	1	32	53	5.1	.76	--	.01	--	.77	--	.06
APR											
13...	1	40	87	8.8	--	--	--	--	--	--	--
MAY											
02...	0	.0	83	5.1	--	--	--	--	--	--	--
JUN											
09...	0	.0	170	9.6	.34	--	.00	--	.34	--	.00
JUL											
06...	0	.0	180	7.6	--	--	--	--	--	--	--
AUG											
08...	0	.0	180	9.8	--	--	--	--	--	--	--
SEP											
15...	2	51	180	13	--	.34	--	.00	--	.34	--

DATE	NITROGEN, AMMONIA DISSOLVED (MG/L AS N)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN, ORGANIC DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC DIS. (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHORUS, DISSOLVED (MG/L AS P)	PHOSPHORUS, ORTHO, TOTAL (MG/L AS P)	SEDIMENT, SUSPENDED (MG/L)	SEDIMENT DISCHARGE, SUSPENDED (T/DAY)
OCT											
06...	--	--	--	--	--	--	--	--	--	E0	--
NOV											
09...	--	--	--	--	--	--	--	--	--	11	4.9
DEC											
14...	--	.14	--	.28	--	.95	.03	--	.01	12	--
JAN											
12...	--	--	--	--	--	--	--	--	--	1	--
FEB											
08...	--	--	--	--	--	--	--	--	--	E0	--
MAR											
07...	--	.25	--	.31	--	1.1	.06	--	.01	23	32
APR											
13...	--	--	--	--	--	--	--	--	--	5	3.0
MAY											
02...	--	--	--	--	--	--	--	--	--	9	5.0
JUN											
09...	--	.09	--	.09	--	.43	.01	--	.00	14	1.9
JUL											
06...	--	--	--	--	--	--	--	--	--	5	.88
AUG											
08...	--	--	--	--	--	--	--	--	--	29	3.4
SEP											
15...	.10	--	.03	--	.13	--	--	.00	--	23	2.5

Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01516820 - TIOGA RIVER AT LAMBS CREEK, PA.

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD-NESS (MG/L AS CACO3)
OCT										
27...	1000	320	270	4.4	10.5	10.8	96	K2	52	86
MAR										
24...	1020	1780	135	5.3	2.0	13.3	96	0	190	44
MAY										
25...	0955	653	165	5.1	13.0	10.4	98	<1	K2	56
JUN										
28...	0955	104	325	4.5	21.5	9.0	101	<1	K5	120
JUL										
25...	0950	30	515	4.0	21.0	9.4	104	<1	K10	190
AUG										
24...	1030	36	505	3.8	21.5	8.7	98	<1	<1	210
SEP										
27...	0955	51	335	4.8	12.0	10.7	99	<1	K3	150

DATE	HARD-NESS, NONCAR-BONATE (MG/L CACO3)	ACIDITY TOTAL HEATED (MG/L AS H)	ACIDITY (MG/L AS CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)
OCT									
27...	86	.6	31	18	10	2.6	6	.1	1.4
MAR									
24...	41	.4	18	10	4.5	2.6	11	.2	1.2
MAY									
25...	55	.3	17	13	5.6	3.2	11	.2	1.6
JUN									
28...	120	.9	46	26	13	5.4	9	.2	2.0
JUL									
25...	190	1.2	59	39	22	7.3	8	.2	2.3
AUG									
24...	210	1.9	94	44	25	7.0	7	.2	2.4
SEP									
27...	150	.8	39	30	19	5.2	7	.2	1.7

Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01516820 - TIOGA RIVER AT LAMBS CREEK, PA.

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	BICARBONATE (MG/L AS HCO3)	CARBONATE (MG/L AS CO3)	ALKALINITY (MG/L AS CACO3)	CARBON DIOXIDE DISSOLVED (MG/L AS CO2)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	NITROGEN, NITRATE DISSOLVED (MG/L AS N)	NITROGEN, NITRITE DISSOLVED (MG/L AS N)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)
OCT 27...	0	0	0	.0	110	3.4	.51	.00	.51
MAR 24...	4	0	3	29	47	3.2	.54	.00	.54
MAY 25...	1	0	1	13	59	4.2	.34	.00	.34
JUN 28...	0	0	0	.0	130	9.5	.54	.00	.54
JUL 25...	0	0	0	.0	250	11	.37	.00	.37
AUG 24...	0	0	0	.0	250	11	.49	.00	.49
SEP 27...	2	0	2	51	170	8.6	.40	.00	.40

DATE	NITROGEN, AMMONIA DISSOLVED (MG/L AS N)	NITROGEN, ORGANIC DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC DIS, (MG/L AS N)	PHOSPHORUS, DISSOLVED (MG/L AS P)	PHYTOPLANKTON, TOTAL (CELLS PER ML)	CHLOROPHYLL A PHYTOPLANKTON, UNCORR, (UG/L)	CHLOROPHYLL B PHYTOPLANKTON, UNCORR, (UG/L)	SEDIMENT, SUSPENDED (MG/L)	SEDIMENT DISCHARGE, SUSPENDED (T/DAY)
OCT 27...	.08	.19	.27	.00	--	--	--	20	17
MAR 24...	.07	.23	.30	.00	160	.000	.000	54	260
MAY 25...	.04	.25	.29	.00	110	.000	.000	39	69
JUN 28...	.01	.25	.26	.01	1700	.000	.000	28	7.9
JUL 25...	.05	.11	.16	.00	5000	7.17	1.92	E0	--
AUG 24...	.17	.11	.28	.03	10000	.000	.000	E1	--
SEP 27...	.12	.00	.12	.00	460	.000	.000	11	1.5

Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01516820 TIOGA RIVER AT LAMBS CREEK, PA.
PHYTOPLANKTON ANALYSES, OCTOBER 1977 TO SEPTEMBER 1978

DATE	MAR 24,78		MAY 25,78		JUN 28,78		JUL 25,78		AUG 24,78		SEP 27,78	
TIME	1020		0955		0955		0950		1030		0955	
TOTAL CELLS/ML	160		110		1700		5000		10000		460	
DIVERSITY: DIVISION	1.3		0.0		1.1		0.7		0.1		0.5	
.CLASS	1.3		0.0		1.1		0.7		0.1		0.5	
..ORDER	1.3		0.0		1.1		0.8		0.1		0.5	
...FAMILY	1.9		1.8		1.6		0.8		0.1		0.7	
....GENUS	1.9		1.8		1.9		0.8		0.1		0.7	
ORGANISM	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT
CHLOROPHYTA (GREEN ALGAE)												
.CHLOROPHYCEAE												
..CHLOROCOCCALES												
...OOCYSTACEAE												
....ANKISTRODESMUS	--	-	--	-	--	-	*	0	--	-	--	-
...SCENEDESMACEAE												
....SCENEDESMUS	--	-	--	-	--	-	59	1	--	-	--	-
..VOLVOCALES												
...CHLAMYDOMONADACEAE												
....CHLAMYDOMONAS	--	-	--	-	22	1	--	-	*	0	--	-
CHRYSOPHYTA												
.BACILLARIOPHYCEAE												
..CENTRALES												
...COSCINODISCACEAE												
....MELOSIRA	--	-	--	-	--	-	670	13	--	-	--	-
..PENNALES												
...ACHNANTHACEAE												
....ACHNANTHES	--	-	--	-	--	-	--	-	--	-	22	5
...CYMBELLACEAE												
....CYMBELLA	--	-	32#	29	160	9	44	1	--	-	--	-
...EUNOTIACEAE												
....EUNOTIA	--	-	--	-	560#	32	--	-	67	1	--	-
...FRAGILARIACEAE												
....SYNEDRA	14	8	--	-	--	-	--	-	--	-	--	-
...GOMPHONEMATACEAE												
....GOMPHONEMA	14	8	16	14	--	-	--	-	--	-	--	-
...NAVICULACEAE												
....NAVICULA	14	8	48#	43	22	1	*	0	*	0	22	5
...NITZSCHIACEAE												
....NITZSCHIA	--	-	--	-	22	1	--	-	--	-	11	2
...SURIRELLACEAE												
....SURIRELLA	14	8	16	14	--	-	--	-	--	-	--	-
CYANOPHYTA (BLUE-GREEN ALGAE)												
.CYANOPHYCEAE												
..HORMOGONALES												
...OSCILLATORIACEAE												
....LYNGBYA	95#	58	--	-	800#	47	--	-	9900#	99	--	-
....OSCILLATORIA	--	-	--	-	130	8	4200#	84	--	-	400#	88
EUGLENOPHYTA (EUGLENOIDS)												
.EUGLENOPHYCEAE												
..EUGLENALES												
...EUGLENACEAE												
....TRACHELOMONAS	14	8	--	-	--	-	--	-	--	-	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%
* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01517500 - MILL CR NR TIOGA, PA.

WATER QUALITY DATA, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	ACIDITY TOTAL HEATED (MG/L AS H)	ACIDITY (MG/L AS CACO3)	BICAR-BONATE (MG/L AS HCO3)	CAR-BONATE (MG/L AS CO3)	ALKA-LINITY (MG/L AS CACO3)
SEP												
05...	1640	6.3	197	8.8	29.0	11.2	143	.0	.0	87	2	62

DATE	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, ORTHO, TOTAL (MG/L AS P)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT DIS-CHARGE, SUS-PENDED (T/DAY)
SEP												
05...	.2	23	7.8	.07	.16	.34	.50	.57	.01	.01	12	.20

WATER QUALITY DATA, WATER YEAR OCTOBER 1973 TO SEPTEMBER 1974

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	ACIDITY TOTAL HEATED (MG/L AS H)	ACIDITY (MG/L AS CACO3)	BICAR-BONATE (MG/L AS HCO3)	CAR-BONATE (MG/L AS CO3)	ALKA-LINITY (MG/L AS CACO3)
OCT												
11...	0915	10	214	7.8	12.5	10.1	94	--	--	100	0	84
NOV												
07...	1535	25	166	8.5	4.5	13.0	100	.0	.0	68	0	57
DEC												
13...	1035	113	132	6.6	1.5	13.6	97	.0	--	30	0	32
JAN												
09...	1450	--	143	6.4	.0	13.8	94	.1	--	47	0	39
FEB												
13...	1400	--	129	7.6	2.0	13.8	100	.0	--	44	0	36
MAR												
13...	1445	190	109	7.4	1.0	13.7	96	.1	--	30	0	25
APR												
02...	1330	473	123	7.6	4.5	12.8	96	.0	--	31	0	28
MAY												
01...	1345	86	137	8.4	16.0	10.6	106	.0	.0	49	2	37
JUN												
12...	1345	28	152	8.0	19.5	9.5	102	.0	--	69	0	52
JUL												
17...	1545	6.5	189	8.7	26.5	9.2	113	.0	.0	76	6	64
AUG												
14...	1400	6.9	185	8.6	27.5	9.6	120	.0	.0	82	4	69
SEP												
12...	1350	7.2	192	8.5	24.0	9.3	109	.0	.0	82	2	69

DATE	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, ORTHO, TOTAL (MG/L AS P)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT DIS-CHARGE, SUS-PENDED (T/DAY)
OCT												
11...	2.5	14	10	.02	.18	.15	.33	.35	.03	.00	6	.16
NOV												
07...	.3	18	7.0	.14	.08	.19	.27	.41	.01	.00	4	.27
DEC												
13...	12	20	2.5	.72	.06	.19	.25	.97	.03	.02	E0	--
JAN												
09...	30	20	5.5	1.0	.09	.28	.37	1.4	.01	.01	9	--
FEB												
13...	1.8	17	6.0	.70	.02	.24	.26	.96	.01	.01	19	--
MAR												
13...	1.9	8.2	4.0	.45	.06	.21	.27	.72	.02	.01	6	3.1
APR												
02...	1.2	19	4.5	.70	.02	.35	.37	1.1	.08	.02	10	13
MAY												
01...	.3	19	4.2	.10	.16	.29	.45	.55	.02	.01	1	.23
JUN												
12...	1.1	15	6.0	.54	.11	.31	.42	.92	.04	.01	13	.99
JUL												
17...	.3	17	6.4	.16	.05	.14	.19	.35	.01	.00	1	.02
AUG												
14...	.4	12	7.0	.07	.09	.19	.28	.35	.01	.00	3	.06
SEP												
12...	.4	16	8.2	.05	.07	.13	.20	.25	.01	.00	E0	--

Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01517500 - MILL CR NR TIOGA, PA.

WATER QUALITY DATA, WATER YEAR OCTOBER 1974 TO SEPTEMBER 1975

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	ACIDITY TOTAL HEATED (MG/L AS H)	ACIDITY (MG/L AS CACO3)
OCT									
10...	1415	8.1	202	8.1	14.0	10.8	104	.0	--
NOV									
07...	1000	41	176	7.2	8.0	12.8	108	.0	1.0
DEC									
09...	1330	394	113	8.3	2.0	13.6	99	.0	.0
JAN									
14...	1350	160	110	6.3	.5	14.2	99	.0	4.0
FEB									
03...	1330	--	124	6.9	.5	13.8	90	.0	1.0
MAR									
05...	1320	78	121	7.2	.5	13.0	90	.0	20
APR									
01...	1305	76	114	8.1	7.0	12.0	98	.0	1.0
MAY									
14...	1225	100	120	8.9	16.0	10.2	102	.0	.0
JUN									
10...	1400	100	120	7.3	19.0	8.4	89	.0	5.0
JUL									
09...	0945	11	188	8.1	24.0	8.9	100	.0	2.0
AUG									
06...	1300	8.7	199	7.4	20.5	8.5	93	.1	6.0
SEP									
11...	1045	11	206	8.4	16.5	11.0	112	.0	.0

DATE	BICAR-BONATE (MG/L AS HCO3)	CAR-BONATE (MG/L AS CO3)	ALKA-LINITY (MG/L AS CACO3)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)
OCT									
10...	86	1	73	1.1	20	8.0	.02	--	--
NOV									
07...	68	0	57	6.9	27	9.0	.14	--	--
DEC									
09...	29	0	39	.2	22	5.0	1.1	--	--
JAN									
14...	26	0	21	21	21	5.0	.90	--	--
FEB									
03...	37	0	13	7.5	21	5.0	.68	--	--
MAR									
05...	36	0	31	3.6	20	5.5	.95	--	--
APR									
01...	35	0	34	.4	19	6.0	.50	--	--
MAY									
14...	41	0	32	.1	18	3.5	.13	.01	.14
JUN									
10...	46	0	34	3.7	18	3.5	.68	--	--
JUL									
09...	87	0	72	1.1	17	8.0	.16	--	--
AUG									
06...	85	0	64	5.4	13	8.5	.04	.01	.05
SEP									
11...	88	0	75	.6	18	9.0	.00	--	--

DATE	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, ORTHO, TOTAL (MG/L AS P)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT DIS-CHARGE, SUS-PENDED (T/DAY)
OCT								
10...	.07	.13	.20	.22	.01	.00	F0	.00
NOV								
07...	.00	.26	.26	.40	.02	.01	3	.33
DEC								
09...	.07	.46	.53	1.6	.06	.04	24	26
JAN								
14...	.02	.26	.28	1.2	.03	.02	4	1.7
FEB								
03...	.02	.30	.32	1.0	.02	.01	F0	--
MAR								
05...	.01	.26	.27	1.2	.02	.01	3	.64
APR								
01...	.00	.16	.16	.66	.01	.01	1	.21
MAY								
14...	.00	.19	.19	.33	.02	.01	6	1.6
JUN								
10...	.01	.27	.28	.96	.03	.03	1	.27
JUL								
09...	.09	.23	.32	.48	.02	.01	F0	--
AUG								
06...	.01	.12	.13	.18	.01	.01	F0	--
SEP								
11...	.02	.12	.14	.14	.01	.00	F0	--

Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01517500 - MILL CR NR TIOGA, PA.

WATER QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	ACIDITY TOTAL HEATED (MG/L AS H)	ACIDITY (MG/L AS CACO3)
OCT									
07...	1045	45	160	7.2	12.0	10.3	95	.0	5.0
NOV									
11...	1030	49	182	8.2	9.5	12.2	107	.0	.0
DEC									
10...	1200	228	116	6.7	1.5	13.1	94	.1	4.0
JAN									
07...	0955	--	150	6.6	.0	13.2	90	.1	7.0
FEB									
05...	0805	--	129	6.6	.0	14.0	96	.0	5.0
MAR									
09...	0845	104	114	7.2	.0	13.7	94	.0	2.0
APR									
06...	0800	92	120	7.4	4.5	12.9	100	.1	2.0
MAY									
05...	1730	45	134	9.0	16.0	10.4	104	.0	.0
JUN									
01...	1545	43	140	8.4	17.0	10.0	103	.1	.0
JUL									
12...	1635	24	179	8.6	19.0	9.1	97	.0	.0
AUG									
10...	1455	80	140	8.2	19.5	9.2	99	.0	.0
SEP									
07...	1515	6.5	193	9.0	22.0	10.9	124	.0	.0

DATE	BICAR-BONATE (MG/L AS HCO3)	CAR-BONATE (MG/L AS CO3)	ALKA-LINITY (MG/L AS CACO3)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)
OCT									
07...	60	0	53	6.1	19	5.5	.52	--	--
NOV									
11...	64	0	53	.6	17	6.0	.09	--	--
DEC									
10...	37	0	28	12	16	5.1	.37	.01	.38
JAN									
07...	51	0	43	18	21	5.0	--	--	--
FEB									
05...	42	0	29	17	19	4.0	--	--	--
MAR									
09...	34	0	28	3.4	20	4.0	.54	--	--
APR									
06...	40	0	32	2.5	17	4.4	--	--	--
MAY									
05...	49	0	40	.1	17	2.3	--	--	--
JUN									
01...	60	0	49	.4	14	4.2	.19	.01	.20
JUL									
12...	71	2	62	.3	17	5.3	--	--	--
AUG									
10...	58	0	48	.6	22	4.3	--	--	--
SEP									
07...	86	6	76	.2	17	6.0	.01	.01	.02

Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01517500 - MILL CR NR TIOGA, PA.

WATER QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHORUS, ORTHO, TOTAL (MG/L AS P)	ALGAL GROWTH POTENTIAL, BOTTLE TEST (MG/L)	SEDIMENT, SUSPENDED (MG/L)	SEDIMENT DISCHARGE, SUSPENDED (T/DAY)
OCT									
07...	.03	.21	.24	.76	.03	.01	--	10	1.2
NOV									
11...	.00	.17	.17	.26	.01	.01	--	E0	--
DEC									
10...	.03	.40	.43	.81	.10	.03	--	44	27
JAN									
07...	--	--	--	--	--	--	--	E0	--
FEB									
05...	--	--	--	--	--	--	--	E0	--
MAR									
09...	.01	.16	.17	.71	.01	.01	--	E0	--
APR									
06...	--	--	--	--	--	--	.5	E0	--
MAY									
05...	--	--	--	--	--	--	.1	E0	--
JUN									
01...	.02	.21	.23	.43	.02	.01	--	4	.46
JUL									
12...	--	--	--	--	--	--	--	E0	--
AUG									
10...	--	--	--	--	--	--	--	4	.86
SEP									
07...	.02	.16	.18	.20	.02	.01	--	E0	--

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	STREAMFLOW, INSTANTANEOUS (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	ACIDITY TOTAL HEATED (MG/L AS H)	ACIDITY (MG/L AS CACO3)	BICARBONATE (MG/L AS HCO3)	CARBONATE (MG/L AS CO3)
OCT											
06...	1650	7.6	206	8.9	16.0	10.2	102	.0	.0	84	4
NOV											
09...	1420	51	143	7.0	1.5	14.0	99	.1	3.0	52	0
DEC											
14...	1100	--	148	7.4	.0	14.8	101	.1	4.0	46	0
JAN											
12...	1150	--	167	6.8	.0	14.0	96	1.6	5.0	67	0
FEB											
08...	1145	--	202	6.9	.0	14.8	101	.1	4.0	74	0
MAR											
07...	0950	113	109	6.6	.5	13.8	96	.1	3.0	28	0
APR											
13...	1030	59	135	9.0	13.5	12.5	119	.0	.0	35	4
MAY											
02...	1030	55	135	8.0	12.5	11.2	105	.0	2.0	46	0
JUN											
09...	1135	12	185	7.8	14.5	10.0	97	.1	3.0	76	0
JUL											
06...	1025	7.5	210	8.3	23.5	9.8	114	.0	.0	85	0
AUG											
08...	1030	12	155	8.1	21.5	9.4	109	.0	2.0	94	0
SEP											
15...	1045	11	220	8.2	15.5	10.5	104	.0	.0	94	0

Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01517500 - MILL CR NR TIOGA, PA.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	ALKALINITY (MG/L AS CACO3)	CARBON DIOXIDE DISSOLVED (MG/L AS CO2)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	NITROGEN, NITRATE TOTAL (MG/L AS N)	NITROGEN, NITRATE DISSOLVED (MG/L AS N)	NITROGEN, NITRITE TOTAL (MG/L AS N)	NITROGEN, NITRITE DISSOLVED (MG/L AS N)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)
OCT											
06...	72	.2	17	9.3	--	--	--	--	--	--	--
NOV											
09...	43	8.3	25	5.0	--	--	--	--	--	--	--
DEC											
14...	38	2.9	18	6.8	.49	--	.01	--	.50	--	.00
JAN											
12...	55	17	16	7.0	--	--	--	--	--	--	--
FEB											
08...	60	15	18	8.3	--	--	--	--	--	--	--
MAR											
07...	23	11	15	5.5	.64	--	.02	--	.66	--	.04
APR											
13...	32	.1	17	5.4	--	--	--	--	--	--	--
MAY											
02...	38	.7	15	4.7	--	--	--	--	--	--	--
JUN											
09...	62	1.7	28	--	.31	--	.01	--	.32	--	.04
JUL											
06...	70	.7	15	7.5	--	--	--	--	--	--	--
AUG											
08...	77	1.2	14	7.6	--	--	--	--	--	--	--
SEP											
15...	77	.9	16	8.1	--	.05	--	.00	--	.05	--

DATE	NITROGEN, AMMONIA DISSOLVED (MG/L AS N)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN, ORGANIC DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC DIS. (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHORUS, DISSOLVED (MG/L AS P)	PHOSPHORUS, ORTHO, TOTAL (MG/L AS P)	SEDIMENT, SUSPENDED (MG/L)	SEDIMENT DISCHARGE, SUSPENDED (T/DAY)
OCT											
06...	--	--	--	--	--	--	--	--	--	E0	--
NOV											
09...	--	--	--	--	--	--	--	--	--	E0	--
DEC											
14...	--	.13	--	.13	--	.63	.02	--	.01	E0	--
JAN											
12...	--	--	--	--	--	--	--	--	--	E0	--
FEB											
08...	--	--	--	--	--	--	--	--	--	E0	--
MAR											
07...	--	.26	--	.30	--	.96	.04	--	.01	8	2.4
APR											
13...	--	--	--	--	--	--	--	--	--	E0	--
MAY											
02...	--	--	--	--	--	--	--	--	--	3	.45
JUN											
09...	--	.14	--	.18	--	.50	.02	--	.00	E0	--
JUL											
06...	--	--	--	--	--	--	--	--	--	2	.04
AUG											
08...	--	--	--	--	--	--	--	--	--	E0	--
SEP											
15...	.01	--	.13	--	.14	--	--	.01	--	21	.62

Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01517500 - MILL CR NR TIOGA, PA.

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD-NESS (MG/L AS CACO3)
OCT										
27...	1120	78	140	7.9	11.0	11.6	105	67	240	57
FEB										
09...	0955	E110	125	7.5	.0	14.6	100	K4	--	56
MAR										
24...	1155	E150	79	7.2	2.5	13.3	95	21	840	30
MAY										
25...	1120	153	115	8.8	16.5	11.0	112	270	120	44
JUN										
28...	1130	20	185	8.5	23.0	9.4	108	95	71	74
JUL										
25...	1215	7.4	193	8.9	21.0	10.0	111	110	150	84
AUG										
24...	1215	8.0	190	8.8	24.5	10.1	119	53	120	88
SEP										
27...	1115	8.8	190	8.6	15.0	12.0	118	K7	K19	61

DATE	HARD-NESS, NONCAR-BONATE (MG/L CACO3)	ACIDITY TOTAL HEATED (MG/L AS H)	ACIDITY (MG/L AS CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)
OCT									
27...	21	.0	1.0	18	2.9	3.2	11	.2	1.9
FEB									
09...	24	.0	1.0	18	2.7	3.4	11	.2	1.4
MAR									
24...	14	.1	4.0	9.2	1.6	2.2	13	.2	1.4
MAY									
25...	8	.0	.0	14	2.3	2.6	11	.2	1.7
JUN									
28...	10	.0	.0	24	3.5	4.1	10	.2	2.2
JUL									
25...	3	.0	.0	27	4.0	4.5	10	.2	2.3
AUG									
24...	16	.0	.0	28	4.4	4.3	9	.2	2.2
SEP									
27...	0	.0	.0	16	5.1	5.0	15	.3	2.0

DATE	BICAR-BONATE (MG/L AS HCO3)	CAR-BONATE (MG/L AS CO3)	ALKA-LINITY (MG/L AS CACO3)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS N)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)
OCT									
27...	44	0	36	.9	20	5.0	.35	.00	.35
FEB									
09...	39	0	32	2.0	17	4.9	.77	.00	.77
MAR									
24...	20	0	16	2.0	15	2.4	.60	.00	.60
MAY									
25...	40	2	36	.1	14	3.8	.18	.00	.18
JUN									
28...	76	1	64	.4	15	6.5	.24	.01	.25
JUL									
25...	91	4	81	.2	16	6.4	.01	.00	.01
AUG									
24...	78	5	72	.2	16	6.3	.00	.00	.00
SEP									
27...	82	7	79	.3	16	8.5	.00	.00	.00

Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01517500 - MILL CR NR TIOGA, PA.

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	NITROGEN, AMMONIA DISSOLVED (MG/L AS N)	NITROGEN, ORGANIC DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC DIS. (MG/L AS N)	PHOSPHORUS, DISSOLVED (MG/L AS P)	PHYTOPLANKTON, TOTAL (CELLS PER ML)	CHLOROPHYLL A PHYTOPLANKTON, UNCORR. (UG/L)	CHLOROPHYLL B PHYTOPLANKTON, UNCORR. (UG/L)	SEDIMENT, SUSPENDED (MG/L)	SEDIMENT DISCHARGE, SUSPENDED (T/DAY)
OCT									
27...	.00	.39	.39	.00	--	--	--	0	.00
FEB									
09...	.00	.21	.21	.00	--	--	--	E0	--
MAR									
24...	.06	.41	.47	.02	82	.000	.000	29	--
MAY									
25...	.00	.40	.40	.01	450	.000	.000	3	1.2
JUN									
28...	.00	.31	.31	.06	870	.000	.000	4	.22
JUL									
25...	.00	.12	.12	.00	880	1.55	.141	3	.04
AUG									
24...	.00	.26	.26	.01	380	.000	.000	E4	--
SEP									
27...	.03	.00	.03	.00	1200	.000	.000	4	.10

Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01517500 MILL CR NR TIOGA, PA.
PHYTOPLANKTON ANALYSES, OCTOBER 1977 TO SEPTEMBER 1978

DATE	MAR 24,78	MAY 25,78	JUN 28,78	JUL 25,78	AUG 24,78	SEP 27,78
TIME	1155	1120	1130	1215	1215	1115
TOTAL CELLS/ML	82	450	870	880	380	1200
DIVERSITY: DIVISION	0.0	0.5	1.1	1.0	0.3	1.4
.CLASS	0.0	0.5	1.1	1.0	0.3	1.4
..ORDER	0.0	0.5	1.2	1.6	0.3	1.6
...FAMILY	1.5	2.5	2.2	2.4	2.2	2.4
....GENUS	1.5	2.5	2.2	2.6	2.2	2.6

ORGANISM	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT
CHLOROPHYTA (GREEN ALGAE)												
.CHLOROPHYCEAE												
..CHLOROCOCCALES												
...HYDRODICTYACEAE												
....PEDIASTRUM	--	-	--	-	--	-	180#	20	--	-	--	-
...OOCYSTACEAE												
....ANKISTRODESMUS	--	-	--	-	58	7	--	-	--	-	86	7
....QUADRIGULA	--	-	--	-	--	-	--	-	--	-	100	9
...SCENEDESMACEAE												
....CRUCIGENIA	--	-	--	-	--	-	59	7	--	-	--	-
....SCENEDESMUS	--	-	--	-	--	-	230#	27	--	-	420#	36
..VOLVOCALES												
...CHLAMYDOMONADACEAE												
....CHLAMYDOMONAS	--	-	--	-	14	2	--	-	22	6	--	-
..ZYGNEMATALES												
...DESMIDIACEAE												
....COSMARIUM	--	-	--	-	--	-	29	3	--	-	29	2
CHRYSOPHYTA												
.BACILLARIOPHYCEAE												
..CENTRALES												
...COSCINODISCACEAE												
....MELOSIRA	--	-	--	-	--	-	220#	25	--	-	--	-
..PENNALES												
...ACHNANTHACEAE												
....ACHNANTHES	--	-	32	7	43	5	--	-	--	-	43	4
....COCCONEIS	--	-	--	-	--	-	--	-	--	-	43	4
...CYMBELLACEAE												
....CYMBELLA	--	-	110#	25	430#	50	73	8	180#	47	190#	16
...DIATOMACEAE												
....DIATOMA	--	-	--	-	--	-	--	-	22	6	--	-
...FRAGILARIACEAE												
....SYNEDRA	14#	17	80#	18	--	-	--	-	--	-	14	1
...GOMPHONEMATACEAE												
....GOMPHONEMA	--	-	--	-	29	3	44	5	45	12	--	-
...MERIDIONACEAE												
....MERIDION	27#	33	--	-	--	-	--	-	--	-	--	-
...NAVICULACEAE												
....NAVICULA	41#	50	80#	18	29	3	--	-	67#	18	14	1
...NITZSCHIACEAE												
....NITZSCHIA	--	-	--	-	87	10	44	5	45	12	--	-
...SURIRELLACEAE												
....SURIRELLA	--	-	96#	21	--	-	--	-	--	-	--	-
CYANOPHYTA (BLUE-GREEN ALGAE)												
.CYANOPHYCEAE												
..CHROOCOCCALES												
...CHROOCOCCACEAE												
....ANACYSTIS	--	-	48	11	--	-	--	-	--	-	230#	20
..HORMOGONALES												
...OSCILLATORIACEAE												
....OSCILLATORIA	--	-	--	-	170#	20	--	-	--	-	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%
* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01518000 - TIOGA RIVER AT TIOGA, PA.

WATER QUALITY DATA, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	ACIDITY (MG/L AS CACO3)	BICAR-BONATE (MG/L AS HCO3)	CAR-BONATE (MG/L AS CO3)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2)
SEP											
06...	1000	197	332	4.9	22.0	9.4	107	21	1	0	20

DATE	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, ORTHO, TOTAL (MG/L AS P)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT DIS-CHARGE, SUS-PENDED (T/DAY)
SEP											
06...	130	10	.59	.29	.69	.98	1.6	.09	.06	93	49

Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01518000 - TIOGA RIVER AT TIOGA, PA.

WATER QUALITY DATA, WATER YEAR OCTOBER 1973 TO SEPTEMBER 1974

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	ACIDITY TOTAL HEATED (MG/L AS H)	ACIDITY (MG/L AS CACO3)	BICAR-BONATE (MG/L AS HCO3)	CAR-BONATE (MG/L AS CO3)	ALKA-LINITY (MG/L AS CACO3)
OCT												
09...	1530	82	294	5.0	16.5	9.8	100	--	25	0	0	--
NOV												
06...	1145	190	194	5.3	4.0	12.9	98	.2	13	0	0	--
DEC												
11...	1415	868	145	5.7	2.5	12.8	94	.1	12	7	0	--
JAN												
08...	1125	E230	213	5.8	.0	11.4	78	.5	42	2	0	--
FEB												
13...	1435	E200	160	5.7	2.5	13.6	100	.2	12	3	0	--
MAR												
13...	1600	699	152	5.5	2.0	13.4	97	.2	19	16	0	--
APR												
02...	1445	1780	141	6.8	7.0	12.6	103	.1	12	23	0	23
MAY												
01...	1445	413	166	6.7	16.0	9.4	95	.1	10	14	0	15
JUN												
12...	1445	133	181	6.8	19.5	8.8	95	.0	11	14	0	13
JUL												
17...	1515	65	315	4.4	24.0	8.3	98	.4	69	0	0	0
AUG												
14...	1500	35	413	4.5	29.0	7.7	99	.5	24	1	0	1
SEP												
12...	1445	30	407	4.3	25.0	8.2	97	.7	34	1	0	0

DATE	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, ORTHO, TOTAL (MG/L AS P)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT DIS-CHARGE, SUS-PENDED (T/DAY)
OCT												
09...	.0	116	8.7	.16	.03	.18	.21	.37	.03	.02	9	2.0
NOV												
06...	.4	78	3.0	.29	.12	.18	.30	.59	.03	.02	29	15
DEC												
11 ..	22	46	2.1	.63	.11	.23	.34	.97	.06	.05	44	103
JAN												
08...	5.1	73	6.3	.70	.15	.18	.33	1.0	.03	.01	14	8.7
FEB												
13...	9.6	64	6.0	.80	.13	.26	.39	1.2	.01	.01	13	7.0
MAR												
13...	81	44	5.0	.61	.12	.19	.31	.92	.05	.01	25	47
APR												
02...	5.8	29	7.0	.90	.03	.15	.18	1.1	.15	.05	113	543
MAY												
01...	4.5	49	7.6	.40	.09	.23	.32	.72	.05	.02	23	26
JUN												
12...	3.6	59	5.0	.52	.17	.39	.56	1.1	.03	.01	17	6.1
JUL												
17...	.0	127	7.6	.23	.06	.16	.22	.45	.04	.02	26	4.6
AUG												
14...	51	188	9.0	.32	.15	.15	.30	.62	.01	.01	6	.57
SEP												
12...	80	117	11	.43	.22	.09	.31	.74	.01	.00	9	.73

Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01518000 - TIOGA RIVER AT TIOGA, PA.

WATER QUALITY DATA, WATER YEAR OCTOBER 1973 TO SEPTEMBER 1974

DATE	TIME	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	COBALT, TOTAL RECOVERABLE (UG/L AS CO)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)
FEB 13...	1435	--	--	--	--	--	--	--
MAR 13...	1600	--	--	--	--	--	--	--
APR 02...	1445	--	--	--	--	--	--	--
MAY 01...	1445	1500	1	0	0	21	20	1700
JUN 12...	1445	10	2	0	10	28	10	790
JUL 17...	1515	5900	0	1	0	92	50	380
AUG 14...	1500	4400	0	1	0	72	30	150
SEP 12...	1445	7400	1	1	<10	120	40	310

DATE	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	SELENIUM, TOTAL (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)
FEB 13...	70	--	--	--	--	--	--
MAR 13...	900	--	--	--	--	--	--
APR 02...	80	--	--	--	--	--	--
MAY 01...	--	2	1200	<.5	0	0	140
JUN 12...	--	4	1700	<.5	1	0	210
JUL 17...	--	3	5900	<.5	<1	0	3100
AUG 14...	--	4	5200	<.5	<2	0	710
SEP 12...	--	5	5700	<.5	2	0	900

WATER QUALITY DATA, WATER YEAR OCTOBER 1974 TO SEPTEMBER 1975

DATE	TIME	STREAMFLOW, INSTANTANEOUS (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	ACIDITY TOTAL HEATED (MG/L AS H)	ACIDITY (MG/L AS CACO3)
OCT 10...	1520	48	377	4.5	16.0	9.8	98	.5	25
NOV 07...	1050	194	192	6.7	8.0	11.8	99	.0	2.0
DEC 09...	1430	1880	105	6.9	2.0	13.8	100	.0	10
JAN 14...	1500	785	156	5.3	.0	14.2	97	.2	11
FEB 03...	1430	300	201	4.9	.5	13.6	94	.3	20
MAR 05...	1415	E280	206	5.2	1.0	13.0	92	.3	27
APR 01...	1345	343	146	6.1	6.0	12.2	98	.1	24
MAY 14...	1430	480	145	7.3	16.5	9.4	95	.1	2.0
JUN 10...	1500	E450	165	6.7	19.0	8.7	93	.0	6.0
JUL 09...	1100	E92	248	5.2	24.5	7.8	92	.2	7.0
AUG 06...	1345	E54	375	4.1	20.5	8.7	96	.6	29
SEP 11...	1130	E50	302	6.9	17.5	9.7	101	.1	4.0

AD-A101 909 GEOLOGICAL SURVEY HARRISBURG PA WATER RESOURCES DIV F/G 8/8
PREIMPOUNDMENT WATER QUALITY IN THE TIOGA RIVER BASIN, PENNSYLV--ETC(U)
MAR 81 J R WARD
UNCLASSIFIED USGS/WRD/WRI-81/068 NL

2 OF 2
AD A
101909

END
DATE FILMED
8-81
DTIC

Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01518000 - TIOGA RIVER AT TIOGA, PA.

WATER QUALITY DATA, WATER YEAR OCTOBER 1974 TO SEPTEMBER 1975

DATE	BICARBONATE (MG/L AS HCO3)	CARBONATE (MG/L AS CO3)	ALKALINITY (MG/L AS CACO3)	CARBON DIOXIDE DISSOLVED (MG/L AS CO2)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	NITROGEN, NITRATE TOTAL (MG/L AS N)	NITROGEN, NITRITE TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)
OCT									
10...	2	0	0	101	160	9.5	.23	--	--
NOV									
07...	27	0	24	8.6	63	8.0	.18	--	--
DEC									
09...	14	0	17	2.8	27	3.5	.86	--	--
JAN									
14...	3	0	6	24	61	5.0	.81	--	--
FEB									
03...	2	0	1	40	86	5.5	.61	--	--
MAR									
05...	2	0	2	20	85	5.0	.90	--	--
APR									
01...	6	0	5	7.6	56	5.0	.93	--	--
MAY									
14...	17	0	14	1.4	44	4.0	.29	.01	.30
JUN									
10...	18	0	13	5.7	51	4.5	1.1	--	--
JUL									
09...	2	0	1	20	99	7.5	.23	--	--
AUG									
06...	0	0	0	.0	160	12	.32	.01	.33
SEP									
11...	8	0	10	1.6	120	11	.18	--	--

DATE	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHORUS, ORTHO, TOTAL (MG/L AS P)	SEDIMENT, SUSPENDED (MG/L)	SEDIMENT DISCHARGE, SUSPENDED (T/DAY)
OCT								
10...	.16	.13	.29	.52	.03	.02	E0	--
NOV								
07...	.05	.22	.27	.45	.03	.02	14	7.3
DEC								
09...	.08	.36	.44	1.3	.06	.04	65	330
JAN								
14...	.05	.17	.22	1.0	.04	.02	20	42
FEB								
03...	.08	.22	.30	.91	.02	.01	E0	--
MAR								
05...	.03	.10	.13	1.0	.04	.02	39	41
APR								
01...	.02	.20	.22	1.2	.02	.01	13	12
MAY								
14...	.01	.15	.16	.46	.04	.01	33	43
JUN								
10...	.03	.40	.43	1.5	.03	.02	11	--
JUL								
09...	.05	.10	.15	.38	.01	.00	5	--
AUG								
06...	.16	.05	.21	.54	.04	.01	E0	--
SEP								
11...	.14	.09	.23	.39	.02	.02	E0	--

Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01518000 - TIOGA RIVER AT TIOGA, PA.

WATER QUALITY DATA, WATER YEAR OCTOBER 1974 TO SEPTEMBER 1975

DATE	TIME	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	ARSENIC DISSOLVED (UG/L AS AS)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CADMIUM DISSOLVED (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	CHROMIUM, DISSOLVED (UG/L AS CR)
OCT									
10...	1520	4900	--	<1	--	3	--	0	--
NOV									
07...	1050	960	--	0	--	0	--	0	--
DEC									
09...	1430	1600	--	1	--	0	--	0	--
JAN									
14...	1500	2000	--	1	--	0	--	10	--
FEB									
03...	1430	2700	--	1	--	0	--	0	--
MAR									
05...	1415	--	1400	--	0	--	1	--	0
APR									
01...	1345	--	40	--	1	--	0	--	0
MAY									
14...	1430	--	40	--	0	--	0	--	<10
JUN									
10...	1500	--	40	--	0	--	0	--	0
JUL									
09...	1100	--	270	--	0	--	0	--	0
AUG									
06...	1345	--	4000	--	--	--	--	--	--
SEP									
11...	1130	--	60	--	--	--	--	--	--

DATE	COBALT, TOTAL RECOVERABLE (UG/L AS CO)	COBALT, DISSOLVED (UG/L AS CO)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	COPPER, DISSOLVED (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	LEAD, DISSOLVED (UG/L AS PB)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)
OCT									
10...	3	--	20	--	720	--	2	--	4800
NOV									
07...	20	--	0	--	770	--	0	--	1100
DEC									
09...	8	--	0	--	2600	--	4	--	450
JAN									
14...	28	--	20	--	2200	--	1	--	1400
FEB									
03...	38	--	20	--	1800	--	2	--	2300
MAR									
05...	--	31	--	10	--	470	--	1	--
APR									
01...	--	19	--	0	--	170	--	0	--
MAY									
14...	--	9	--	0	--	40	--	0	--
JUN									
10...	--	23	--	10	--	70	--	0	--
JUL									
09...	--	36	--	10	--	70	--	1	--
AUG									
06...	--	--	--	--	--	110	--	--	--
SEP									
11...	--	--	--	--	--	80	--	--	--

Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01518000 - TIOGA RIVER AT TIOGA, PA.

WATER QUALITY DATA, WATER YEAR OCTOBER 1974 TO SEPTEMBER 1975

DATE	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	MERCURY DISSOLVED (UG/L AS HG)	SELENIUM, TOTAL (UG/L AS SE)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	SILVER, DISSOLVED (UG/L AS AG)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	ZINC, DISSOLVED (UG/L AS ZN)
OCT									
10...	--	<.5	--	<2	--	0	--	750	--
NOV									
07...	--	<.5	--	0	--	0	--	190	--
DEC									
09...	--	<.5	--	0	--	0	--	60	--
JAN									
14...	--	<.5	--	2	--	0	--	140	--
FEB									
03...	--	<.5	--	0	--	0	--	300	--
MAR									
05...	1600	--	<.5	--	1	--	0	--	260
APR									
01...	1300	--	<.5	--	0	--	0	--	160
MAY									
14...	810	--	<.5	--	1	--	0	--	70
JUN									
10...	1200	--	<.5	--	1	--	0	--	120
JUL									
09...	2900	--	<.5	--	0	--	0	--	620
AUG									
06...	5100	--	--	--	--	--	--	--	590
SEP									
11...	3400	--	--	--	--	--	--	--	440

WATER QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	TIME	STREAMFLOW, INSTANTANEOUS (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	ACIDITY TOTAL HEATED (MG/L AS H)	ACIDITY (MG/L AS CACO3)
OCT									
07...	1130	283	259	6.0	13.0	10.2	96	.2	10
NOV									
11...	1120	355	173	6.9	9.5	11.0	96	.1	4.0
DEC									
10...	1330	998	119	6.4	2.0	13.0	94	.1	6.0
JAN									
07...	1035	E200	239	5.7	.0	13.4	92	.2	15
FEB									
05...	0900	E230	180	6.2	.0	14.0	96	.2	9.0
MAR									
09...	0930	486	159	6.1	.0	13.6	93	.0	5.0
APR									
06...	0900	425	157	6.4	5.0	11.9	93	.1	15
MAY									
06...	1030	181	185	6.6	14.5	9.6	93	.1	7.0
JUN									
02...	0805	293	177	6.7	13.0	10.0	94	.1	4.0
JUL									
13...	1030	134	243	5.8	15.5	9.0	89	.2	7.0
AUG									
11...	0815	301	179	6.3	17.0	9.2	95	.1	6.0
SEP									
08...	0745	45	429	4.8	16.0	9.0	90	.5	27

Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01518000 - TIOGA RIVER AT TIOGA, PA.

WATER QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	BICARBONATE (MG/L AS HCO3)	CARBONATE (MG/L AS CO3)	ALKALINITY (MG/L AS CACO3)	CARBON DIOXIDE DISSOLVED (MG/L AS CO2)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	NITROGEN, NITRATE TOTAL (MG/L AS N)	NITROGEN, NITRITE TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)
OCT									
07...	4	0	5	6.4	100	5.0	.68	--	--
NOV									
11...	18	0	14	3.6	51	5.0	.29	--	--
DEC									
10...	22	0	15	14	29	4.9	.39	.01	.40
JAN									
07...	4	0	4	13	120	5.0	--	--	--
FEB									
05...	8	0	6	5.1	63	7.0	--	--	--
MAR									
09...	6	0	5	7.6	61	4.0	.97	--	--
APR									
06...	16	0	4	10	47	6.0	--	--	--
MAY									
06...	15	0	11	6.0	61	3.2	--	--	--
JUN									
02...	24	0	17	7.7	53	5.3	.37	.01	.38
JUL									
13...	4	0	3	10	98	4.9	--	--	--
AUG									
11...	6	0	5	4.8	68	4.0	--	--	--
SEP									
08...	2	0	1	51	180	6.9	.35	.01	.36

DATE	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHORUS, ORTHO, TOTAL (MG/L AS P)	SEDIMENT, SUSPENDED (MG/L)	SEDIMENT DISCHARGE, SUSPENDED (T/DAY)
OCT								
07...	.09	.20	.29	.97	.04	.02	49	37
NOV								
11...	.01	.21	.22	.51	.03	.02	52	50
DEC								
10...	.04	.40	.44	.84	.16	.02	176	474
JAN								
07...	--	--	--	--	--	--	20	19
FEB								
05...	--	--	--	--	--	--	14	--
MAR								
09...	.05	.25	.30	1.3	.02	.01	19	25
APR								
06...	--	--	--	--	--	--	36	41
MAY								
06...	--	--	--	--	--	--	10	4.9
JUN								
02...	.04	.21	.25	.63	.05	.01	19	15
JUL								
13...	--	--	--	--	--	--	14	5.1
AUG								
11...	--	--	--	--	--	--	19	15
SEP								
08...	.15	.05	.20	.56	.02	.01	6	.73

DATE	TIME	ALUMINUM, DISSOLVED (UG/L AS AL)	IRON, DISSOLVED (UG/L AS FE)	MANGANESE, DISSOLVED (UG/L AS MN)	ZINC, DISSOLVED (UG/L AS ZN)
OCT					
07...	1130	250	190	3400	340
NOV					
11...	1120	30	10	1400	160

Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01518000 - TIOGA RIVER AT TIOGA, PA.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	ACIDITY TOTAL HEATED (MG/L AS H)	ACIDITY (MG/L AS CACO3)	BICAR-BONATE (MG/L AS HCO3)	CAR-BONATE (MG/L AS CO3)
OCT											
07...	0925	43	391	5.4	14.0	9.8	94	.2	11	3	0
NOV											
10...	0825	209	209	6.0	.5	13.2	92	.2	9.0	5	0
DEC											
14...	1330	E170	199	6.5	.0	13.8	95	.1	5.0	17	0
JAN											
12...	1420	E76	286	5.4	.0	12.8	88	.5	26	6	0
FEB											
08...	1350	E49	339	5.2	.0	13.0	89	.7	33	5	0
MAR											
07...	1225	605	139	5.4	1.0	13.6	96	.2	8.0	2	0
APR											
13...	1345	281	190	5.8	14.5	10.3	100	.2	8.0	4	0
MAY											
02...	1305	259	183	6.0	13.5	10.0	95	.2	8.0	5	0
JUN											
09...	1730	84	304	5.2	13.0	10.2	96	.3	14	2	0
JUL											
06...	1405	79	350	4.8	26.0	7.8	95	.6	30	1	0
AUG											
08...	1535	68	270	7.2	28.5	9.1	116	.0	2.0	7	0
SEP											
15...	1445	90	320	7.3	18.5	9.2	97	.1	4.0	44	0

DATE	ALKA-LINITY (MG/L AS CACO3)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)
OCT											
07...	2	19	150	9.6	--	--	--	--	--	--	--
NOV											
10...	4	8.0	70	5.4	--	--	--	--	--	--	--
DEC											
14...	14	8.6	64	8.3	.60	--	.01	--	.61	--	.07
JAN											
12...	5	38	120	9.2	--	--	--	--	--	--	--
FEB											
08...	4	50	130	11	--	--	--	--	--	--	--
MAR											
07...	2	13	45	4.8	.71	--	.01	--	.72	--	.06
APR											
13...	3	10	66	5.9	--	--	--	--	--	--	--
MAY											
02...	4	8.0	65	5.2	--	--	--	--	--	--	--
JUN											
09...	2	20	120	8.6	.32	--	.01	--	.33	--	.00
JUL											
06...	1	25	140	7.7	--	--	--	--	--	--	--
AUG											
08...	6	.7	130	11	--	--	--	--	--	--	--
SEP											
15...	36	3.5	91	11	--	.30	--	.00	--	.10	--

Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01518000 - TIOGA RIVER AT TIOGA, PA.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	NITROGEN, AMMONIA DISSOLVED (MG/L AS N)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN, ORGANIC DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC DIS. (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHORUS, DISSOLVED (MG/L AS P)	PHOSPHORUS, ORTHO, TOTAL (MG/L AS P)	SEDIMENT, SUSPENDED (MG/L)	SEDIMENT DISCHARGE, SUSPENDED (T/DAY)
OCT											
07...	--	--	--	--	--	--	--	--	--	14	1.6
NOV											
10...	--	--	--	--	--	--	--	--	--	16	8.5
DEC											
14...	--	.16	--	.23	--	.84	.03	--	.01	14	--
JAN											
12...	--	--	--	--	--	--	--	--	--	6	--
FEB											
08...	--	--	--	--	--	--	--	--	--	--	--
MAR											
07...	--	.13	--	.19	--	.91	.03	--	.01	22	36
APR											
13...	--	--	--	--	--	--	--	--	--	13	9.9
MAY											
02...	--	--	--	--	--	--	--	--	--	12	8.4
JUN											
09...	--	.10	--	.10	--	.43	.01	--	.00	46	10
JUL											
06...	--	--	--	--	--	--	--	--	--	9	1.9
AUG											
08...	--	--	--	--	--	--	--	--	--	17	3.1
SEP											
15...	.08	--	.39	--	.47	--	--	.01	--	81	20

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	TIME	STREAMFLOW, INSTANTANEOUS (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML)	STREPTOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARDNESS (MG/L AS CACO3)
OCT										
27...	1400	550	195	6.9	12.5	10.7	100	K11	K15	74
FEB										
09...	1340	350	180	6.5	.0	14.1	97	0	--	71
MAR										
24...	1540	4220	110	6.7	4.5	12.7	98	1	*200*	38
MAY										
25...	1615	820	140	7.5	18.0	10.4	109	170	62	54
JUN										
28...	1645	149	270	7.1	24.5	8.5	101	--	K10	*110*
JUL										
25...	1815	66	360	7.2	22.0	9.4	107	K4	K5	150
AUG										
24...	1710	88	360	6.1	25.5	8.8	106	<1	<1	*160*
SEP										
28...	1300	90	305	6.2	15.5	10.4	103	<1	K11	*140*

Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01518000 - TIOGA RIVER AT TIOGA, PA.

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	HARDNESS, NONCARBONATE (MG/L CACO3)	ACIDITY TOTAL HEATED (MG/L AS H)	ACIDITY (MG/L AS CACO3)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)
OCT									
27...	54	.2	8.0	20	5.8	3.4	9	.2	1.8
FEB									
09...	57	.2	8.0	19	5.6	4.0	11	.2	1.4
MAR									
24...	30	.2	8.0	10	3.2	2.4	12	.2	1.3
MAY									
25...	23	.1	4.0	16	3.4	3.4	12	.2	1.6
JUN									
28...	91	.1	4.0	27	9.4	5.1	9	.2	2.1
JUL									
25...	130	.1	3.0	36	14	6.8	9	.2	2.4
AUG									
24...	160	.1	7.0	38	17	6.5	8	.2	2.4
SEP									
28...	130	.2	10	31	16	5.4	7	.2	1.8

DATE	BICARBONATE (MG/L AS HCO3)	CARBONATE (MG/L AS CO3)	ALKALINITY (MG/L AS CACO3)	CARBON DIOXIDE DISSOLVED (MG/L AS CO2)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	NITROGEN, NITRATE DISSOLVED (MG/L AS N)	NITROGEN, NITRITE DISSOLVED (MG/L AS N)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)
OCT									
27...	24	0	20	4.8	54	4.3	.40	.00	.40
FEB									
09...	17	0	14	8.6	50	5.3	.69	.00	.69
MAR									
24...	10	0	8	3.2	32	2.5	.53	.00	.53
MAY									
25...	38	0	31	1.7	27	3.9	.18	.00	.18
JUN									
28...	23	0	19	2.9	88	7.7	.38	.01	.39
JUL									
25...	23	0	19	2.3	130	8.9	.22	.00	.22
AUG									
24...	6	0	5	7.6	150	8.1	.36	.00	.36
SEP									
28...	12	0	10	12	360	.4	.29	.01	.30

DATE	NITROGEN, AMMONIA DISSOLVED (MG/L AS N)	NITROGEN, ORGANIC DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC DIS, (MG/L AS N)	PHOSPHORUS, DISSOLVED (MG/L AS P)	PHYTOPLANKTON, TOTAL (CELLS PER ML)	CHLOROPHYLL A PHYTOPLANKTON, UNCORR, (UG/L)	CHLOROPHYLL B PHYTOPLANKTON, UNCORR, (UG/L)	SEDIMENT, SUSPENDED (MG/L)	SEDIMENT DISCHARGE, SUSPENDED (T/DAY)
OCT									
27...	.03	.23	.26	.00	--	--	--	13	19
FEB									
09...	.07	.27	.34	.00	--	--	--	E10	--
MAR									
24...	.06	.35	.41	.00	82	.000	.000	70	798
MAY									
25...	.01	.42	.43	.01	460	.000	.000	25	55
JUN									
28...	.02	.17	.19	.00	1200	2.24	.000	8	3.2
JUL									
25...	.02	.14	.16	.00	2300	.000	.000	3	.53
AUG									
24...	.02	.17	.19	.01	1600	.000	.000	11	2.0
SEP									
28...	.13	.12	.25	.00	110	.000	.000	11	2.7

Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01518000 TIOGA RIVER AT TIOGA, PA.
PHYTOPLANKTON ANALYSES, OCTOBER 1977 TO SEPTEMBER 1978

DATE	MAR 24,78		MAY 25,78		JUN 28,78		JUL 25,78		AUG 24,78		SEP 28,78	
TIME	1540		1615		1645		1815		1710		1300	
TOTAL CELLS/ML	82		460		1200		2300		1600		110	
DIVERSITY: DIVISION	0.0		1.8		1.4		1.6		0.6		1.2	
.CLASS	0.0		1.8		1.4		1.6		0.6		1.2	
..ORDER	0.0		2.1		1.4		1.8		0.6		1.2	
...FAMILY	1.8		2.8		2.3		2.2		0.7		2.6	
....GENUS	1.8		3.0		2.3		2.2		0.7		2.6	
ORGANISM	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT
CHLOROPHYTA (GREEN ALGAE)												
.CHLOROPHYCEAE												
..CHLOROCOCCALES												
...OOCYSTACEAE												
....ANKISTRODESMUS	--	-	16	3	45	4	--	-	--	-	--	-
....SELENASTRUM	--	-	--	-	--	-	36	?	--	-	--	-
...SCENEDESMACEAE												
....SCENEDESMUS	--	-	--	-	--	-	290	13	--	-	22#	20
....TETRASTRUM	--	-	64	14	--	-	--	-	--	-	--	-
..VOLVOCALES												
...CHLAMYDOMONADACEAE												
....CHLAMYDOMONAS	--	-	32	7	--	-	110	5	89	5	--	-
CHRYSOPHYTA												
.BACILLARIOPHYCEAE												
..CENTRALES												
...COSCINODISCACEAE												
....CYCLOTELLA	--	-	--	-	--	-	36	?	--	-	--	-
..PENNALES												
...*ACHNANTHACEAE*												
....ACHNANTHES	--	-	--	-	540#	44	570#	25	45	3	34#	30
...CYMBELLACEAE												
....CYMBELLA	--	-	48	10	45	4	71	3	--	-	11	10
...FRAGILARIACEAE												
....SYNEDRA	--	-	--	-	45	4	--	-	--	-	--	-
...GOMPHONEMATACEAE												
....GOMPHONEMA	41#	50	16	3	--	-	--	-	22	1	--	-
...MERIDIONACEAE												
....MERIDION	--	-	16	3	--	-	--	-	--	-	--	-
...NAVICULACEAE												
....NAVICULA	14#	17	130#	28	130	11	71	3	22	1	11	10
...NITZSCHIACEAE												
....NITZSCHIA	14#	17	--	-	22	2	--	-	--	-	11	10
...SURIRELLACEAE												
....SURIRELLA	14#	17	--	-	--	-	--	-	--	-	11	10
CRYPTOPHYTA (CRYPTOMONADS)												
.CRYPTOPHYCEAE												
..CRYPTOMONADALES												
...CRYPTOMONADACEAE												
....CRYPTOMONAS	--	-	--	-	22	2	--	-	--	-	--	-
CYANOPHYTA (BLUE-GREEN ALGAE)												
.CYANOPHYCEAE												
..CHROOCOCCALES												
...CHROOCOCCACEAE												
....ANACYSTIS	--	-	80#	17	--	-	--	-	--	-	--	-
..HORMOGONALES												
...OSCILLATORIACEAE												
....OSCILLATORIA	--	-	--	-	340#	27	1100#	47	1500#	89	--	-
EUGLENOPHYTA (EUGLENOIDS)												
.EUGLENOPHYCEAE												
..EUGLENALES												
...EUGLENACEAE												
....EUGLENA	--	-	32	7	45	4	36	?	--	-	11	10
....TRACHELOMONAS	--	-	32	7	--	-	--	-	--	-	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%
* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01518400 - CROOKED CREEK AT MIDDLEBURY CENTER, PA.

WATER QUALITY DATA, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	BICAR-BONATE (MG/L AS HCO3)	CAR-BONATE (MG/L AS CO3)	ALKA-LINITY (MG/L AS CACO3)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2)
SEP											
05...	0915	24	206	7.5	22.5	11.4	130	89	0	61	4.5

DATE	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, ORTHO, TOTAL (MG/L AS P)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT DIS-CHARGE, SUS-PENDED (T/DAY)
SEP											
05...	17	8.9	.29	.22	.32	.54	.83	.04	.02	8	.52

WATER QUALITY DATA, WATER YEAR OCTOBER 1973 TO SEPTEMBER 1974

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	ACIDITY TOTAL HEATED (MG/L AS H)	ACIDITY (MG/L AS CACO3)	BICAR-BONATE (MG/L AS HCO3)	CAR-BONATE (MG/L AS CO3)	ALKA-LINITY (MG/L AS CACO3)
OCT												
10...	0930	16	225	7.2	14.5	9.8	95	--	--	105	0	61
NOV												
07...	0820	39	179	7.2	3.5	12.2	92	.0	--	74	0	68
DEC												
12...	0845	146	141	7.1	2.0	13.0	94	.0	--	44	0	59
JAN												
09...	1545	--	165	6.2	.0	13.8	94	.1	--	55	0	39
FEB												
14...	1715	--	145	6.6	.5	14.5	101	.1	--	50	0	47
MAR												
15...	0900	69	130	7.4	.5	13.4	93	.1	--	38	0	41
APR												
04...	0915	453	93	7.2	9.5	10.8	94	.0	--	25	0	25
MAY												
03...	0915	50	151	7.2	9.5	10.9	120	.1	--	57	0	18
JUN												
14...	0845	8.0	185	7.3	14.0	--	--	.0	6.0	84	0	48
JUL												
18...	1525	6.9	190	8.5	25.0	9.4	112	.0	9.0	76	4	69
AUG												
16...	0830	3.3	221	7.5	18.0	7.0	74	.0	--	92	0	73

DATE	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, ORTHO, TOTAL (MG/L AS P)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT DIS-CHARGE, SUS-PENDED (T/DAY)
OCT												
10...	11	15	12	.14	.05	.12	.17	.31	.03	.01	14	.60
NOV												
07...	7.5	20	8.0	.29	.06	.18	.24	.53	.02	.02	3	.32
DEC												
12...	5.6	24	2.5	.68	.09	.18	.27	.95	.11	.08	E0	--
JAN												
09...	56	22	6.2	1.2	.07	.28	.35	1.6	.02	.01	6	--
FEB												
14...	20	18	7.0	.90	.07	.30	.37	1.3	.03	.01	4	--
MAR												
15...	2.4	14	5.5	.70	.05	.18	.23	.93	.01	.01	E0	--
APR												
04...	2.5	17	3.0	.50	.03	.50	.53	1.0	.09	.04	68	83
MAY												
03...	5.8	20	5.5	.20	.11	.20	.31	.51	.02	.01	1	.13
JUN												
14...	6.7	19	7.5	.50	.23	.22	.45	.95	.36	.35	6	.13
JUL												
18...	.4	24	7.4	.14	.13	.19	.32	.46	.03	.01	E0	--
AUG												
16...	4.7	17	9.0	.11	.13	.23	.36	.47	.08	.06	6	.05

Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01518400 - CROOKED CREEK AT MIDDLEBURY CENTER, PA.

WATER QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	ACIDITY TOTAL HEATED (MG/L AS H)	ACIDITY (MG/L AS CACO3)
APR									
06...	1000	--	135	6.7	4.5	13.4	104	--	3.0
MAY									
06...	0830	32	158	7.3	11.5	9.4	86	.2	4.0
JUN									
01...	1645	157	134	8.1	15.5	9.7	96	.2	6.0
JUL									
13...	0840	20	214	7.4	16.0	7.8	78	.1	6.0
AUG									
10...	1550	20	198	7.7	20.0	8.8	96	.0	2.0
SEP									
07...	1625	4.3	239	8.5	19.0	11.0	117	.0	.0

DATE	BICAR-BONATE (MG/L AS HCO3)	CAR-BONATE (MG/L AS CO3)	ALKA-LINITY (MG/L AS CACO3)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)
APR									
06...	--	--	35	--	--	--	--	--	--
MAY									
06...	76	0	51	6.1	16	4.6	--	--	--
JUN									
01...	53	0	45	.7	14	4.3	.21	01	.22
JUL									
13...	86	0	70	5.5	18	6.6	--	--	--
AUG									
10...	93	0	76	3.0	18	8.8	--	--	--
SEP									
07...	100	1	83	.5	22	11	.02	.02	.04

DATE	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, ORTHO, TOTAL (MG/L AS P)	ALGAL GROWTH POTEN-TIAL, BOTTLE TEST (MG/L)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT DIS-CHARGE, SUS-PENDED (T/DAY)
APR									
06...	--	--	--	--	--	--	.7	--	--
MAY									
06...	--	--	--	--	--	--	.2	5	.43
JUN									
01...	.01	.24	.25	.47	.05	.02	--	5	2.1
JUL									
13...	--	--	--	--	--	--	--	E0	--
AUG									
10...	--	--	--	--	--	--	--	E0	--
SEP									
07...	.03	.27	.30	.34	.03	.01	--	5	.06

Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01518400 - CROOKED CREEK AT MIDDLEBURY CENTER, PA.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	ACIDITY TOTAL HEATED (MG/L AS H)	ACIDITY (MG/L AS CACO3)	BICAR-BONATE (MG/L AS HCO3)	CAR-BONATE (MG/L AS CO3)
OCT											
07...	0820	4.7	255	7.4	14.0	7.6	73	.1	5.0	97	0
NOV											
09...	1520	32	177	6.8	1.0	13.2	93	.1	3.0	66	0
DEC											
14...	1200	--	179	7.2	.0	13.6	93	.1	6.0	60	0
JAN											
12...	1240	--	153	7.1	.0	13.0	89	.1	5.0	79	0
FEB											
08...	1230	--	220	7.0	.0	13.2	90	.1	5.0	84	0
MAR											
07...	1040	142	110	6.5	1.0	13.4	94	.1	3.0	28	0
APR											
13...	1130	60	141	8.2	11.5	12.6	115	.0	1.0	43	0
MAY											
02...	1140	49	139	7.4	12.0	11.4	106	.1	4.0	48	0
JUN											
09...	1410	13	213	7.6	13.0	8.6	81	.1	4.0	89	0
JUL											
06...	1225	8.4	234	7.8	25.5	7.8	94	.1	4.0	93	0
AUG											
08...	1330	36	244	8.3	23.5	9.2	107	.0	.0	99	0
SEP											
15...	1305	18	240	8.0	14.5	10.4	101	.0	2.0	96	0

DATE	ALKA-LINITY (MG/L AS CACO3)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)
OCT											
07...	80	6.2	19	13	--	--	--	--	--	--	--
NOV											
09...	54	17	25	7.2	--	--	--	--	--	--	--
DEC											
14...	49	6.1	23	9.3	.76	--	.01	--	.77	--	.01
JAN											
12...	64	10	18	9.7	--	--	--	--	--	--	--
FEB											
08...	69	13	19	10	--	--	--	--	--	--	--
MAR											
07...	23	14	15	5.0	.58	--	.01	--	.59	--	.04
APR											
13...	35	.4	18	5.7	--	--	--	--	--	--	--
MAY											
02...	39	3.1	15	4.7	--	--	--	--	--	--	--
JUN											
09...	73	3.6	17	7.8	.40	--	.01	--	.41	--	.16
JUL											
06...	76	2.4	16	9.4	--	--	--	--	--	--	--
AUG											
08...	81	.8	18	9.9	--	--	--	--	--	--	--
SEP											
15...	79	1.5	19	11	--	.21	--	.00	--	.21	--

Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01518400 - CROOKED CREEK AT MIDDLEBURY CENTER, PA.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	NITROGEN, AMMONIA DISSOLVED (MG/L AS N)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN, ORGANIC DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC DIS. (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHORUS, DISSOLVED (MG/L AS P)	PHOSPHORUS, ORTHO, TOTAL (MG/L AS P)	SEDIMENT, SUSPENDED (MG/L)	SEDIMENT DISCHARGE, SUSPENDED (T/DAY)
OCT											
07...	--	--	--	--	--	--	--	--	--	114	1.4
NOV											
09...	--	--	--	--	--	--	--	--	--	23	2.0
DEC											
14...	--	.27	--	.28	--	1.1	.03	--	.02	22	--
JAN											
12...	--	--	--	--	--	--	--	--	--	E9	--
FEB											
08...	--	--	--	--	--	--	--	--	--	4	--
MAR											
07...	--	.21	--	.25	--	.84	.04	--	.01	23	8.8
APR											
13...	--	--	--	--	--	--	--	--	--	1	.16
MAY											
02...	--	--	--	--	--	--	--	--	--	E9	--
JUN											
09...	--	.42	--	.58	--	.99	.05	--	.02	37	1.3
JUL											
06...	--	--	--	--	--	--	--	--	--	10	.23
AUG											
08...	--	--	--	--	--	--	--	--	--	23	2.2
SEP											
15...	.03	--	.35	--	.38	--	--	.02	--	18	.87

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	TIME	STREAMFLOW, INSTANTANEOUS (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML)	STREPTOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARDNESS (MG/L AS CACO3)
OCT										
27...	1215	73	155	7.8	10.5	11.7	104	K37	600	64
FEB										
09...	1135	E45	145	7.4	.0	13.8	95	K7	--	58
MAR										
24...	0720	E300	85	7.1	1.5	13.3	95	100	5900	32
MAY										
25...	1350	113	140	9.1	18.5	12.0	127	81	130	52
JUN										
28...	1335	10	200	7.8	23.0	8.4	97	--	130	82
JUL										
25...	1600	7.3	220	7.9	22.0	9.2	105	160	240	86
AUG										
24...	1440	4.6	235	8.8	25.0	12.3	146	29	86	100
SEP										
28...	1030	6.8	210	7.4	14.5	9.6	93	180	210	57

DATE	HARDNESS, NONCARBONATE (MG/L CACO3)	ACIDITY TOTAL HEATED (MG/L AS H)	ACIDITY (MG/L AS CACO3)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)
OCT									
27...	18	.0	2.0	21	2.9	3.8	11	.2	2.0
FEB									
09...	18	.0	.0	19	2.6	4.4	14	.3	1.8
MAR									
24...	13	.1	4.0	10	1.6	2.5	14	.2	1.7
MAY									
25...	8	.0	.0	17	2.3	3.5	12	.2	1.7
JUN									
28...	12	.1	5.0	27	3.5	5.6	13	.3	2.2
JUL									
25...	6	.0	2.0	28	3.8	11	21	.5	2.5
AUG									
24...	14	.0	.0	35	4.0	8.8	15	.4	2.2
SEP									
28...	0	.1	4.0	15	4.7	7.2	21	.4	2.1

Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01518400 - CROOKED CREEK AT MIDDLEBURY CENTER, PA.

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	BICARBONATE (MG/L AS HCO3)	CARBONATE (MG/L AS CO3)	ALKALINITY (MG/L AS CACO3)	CARBON DIOXIDE DISSOLVED (MG/L AS CO2)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	NITROGEN, NITRATE DISSOLVED (MG/L AS N)	NITROGEN, NITRITE DISSOLVED (MG/L AS N)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)
OCT									
27...	56	0	46	1.4	18	4.5	.41	.00	.41
FEB									
09...	49	0	40	3.1	18	5.0	.76	.00	.76
MAR									
24...	23	0	19	2.6	13	2.2	.57	.01	.58
MAY									
25...	45	4	44	.1	14	4.3	--	--	--
JUN									
28...	85	0	70	2.2	16	7.5	.46	.01	.47
JUL									
25...	98	0	80	2.0	18	8.6	.11	.01	.12
AUG									
24...	93	6	86	.3	21	8.8	.01	.00	.01
SEP									
28...	84	0	69	5.4	22	11	.08	.01	.09

DATE	NITROGEN, AMMONIA DISSOLVED (MG/L AS N)	NITROGEN, ORGANIC DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC DIS, (MG/L AS N)	PHOSPHORUS, DISSOLVED (MG/L AS P)	PHYTOPLANKTON, TOTAL (CELLS PER ML)	CHLOROPHYLL A PHYTOPLANKTON, UNCORR, (UG/L)	CHLOROPHYLL B PHYTOPLANKTON, UNCORR, (UG/L)	SEDIMENT, SUSPENDED (MG/L)	SEDIMENT DISCHARGE, SUSPENDED (T/DAY)
OCT									
27...	.00	.39	.39	.01	--	--	--	3	.60
FEB									
09...	.02	.23	.25	.09	--	--	--	E10	--
MAR									
24...	.07	E.30	E.37	.02	68	.000	.000	115	--
MAY									
25...	--	--	.39	.05	960	5.42	.000	7	2.1
JUN									
28...	.04	.54	.58	.03	920	.000	.000	9	.25
JUL									
25...	.01	.34	.35	.50	7800	36.9	6.77	11	.22
AUG									
24...	.00	.28	.28	.21	560	11.1	2.57	4	.05
SEP									
28...	.04	.43	.47	.02	210	3.30	.622	7	.13

Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01518400 CROOKED CREEK AT MIDDLEBURY CENTER, PA.
PHYTOPLANKTON ANALYSES, OCTOBER 1977 TO SEPTEMBER 1978

DATE	MAR 24,78		MAY 25,78		JUN 29,78		JUL 25,78		AUG 24,78		SEP 28,78	
TIME	0720		1350		1335		1600		1440		1030	
TOTAL CELLS/ML	68		960		920		7800		560		210	
DIVERSITY: DIVISION	0.0		0.1		0.4		1.4		0.6		0.0	
.CLASS	0.0		0.1		0.4		1.4		0.6		0.0	
..ORDER	0.0		0.3		0.4		1.9		1.1		0.0	
...FAMILY	1.9		2.3		1.8		2.3		2.6		1.8	
....GENUS	1.9		2.3		1.8		3.1		2.6		1.8	
ORGANISM	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT
CHLOROPHYTA (GREEN ALGAE)												
.CHLOROPHYCEAE												
..CHLOROCOCCALES												
...OOCYSTACEAE												
....ANKISTRODESMUS	--	-	--	-	45	5	69	1	15	3	--	-
....KIRCHNERIELLA	--	-	--	-	--	-	69	1	--	-	--	-
....QUADRIGULA	--	-	--	-	--	-	270	4	--	-	--	-
...SCENEDESMACEAE												
....SCENEDESMUS	--	-	--	-	--	-	690	9	--	-	--	-
..VOLVOCALES												
...CHLAMYDOMONADACEAE												
....CHLAMYDOMONAS	--	-	16	2	22	2	1400#	18	59	11	--	-
....CHLOROGONIUM	--	-	--	-	--	-	2100#	26	--	-	--	-
CHRYSOPHYTA												
.BACILLARIOPHYCEAE												
..CENTRALES												
...COSCINODISCACEAE												
....CYCLOTELLA	--	-	32	3	--	-	69	1	59	11	--	-
..PENNALES												
...ACHNANTHACEAE												
....ACHNANTHES	--	-	16	2	--	-	69	1	--	-	--	-
....COCCONEIS	--	-	--	-	--	-	--	-	15	3	--	-
...CYMBELLACEAE												
....CYMBELLA	--	-	220#	23	470#	51	210	3	--	-	59#	29
...DIATOMACEAE												
....DIATOMA	--	-	--	-	--	-	--	-	44	8	--	-
...FRAGILARIACEAE												
....FRAGILARIA	--	-	--	-	--	-	--	-	100#	18	15	7
....SYNEDRA	14#	20	96	10	22	2	--	-	--	-	--	-
...GOMPHONEMATACEAE												
....GOMPHONEMA	14#	20	16	2	22	2	140	2	--	-	15	7
...NAVICULACEAE												
....*NAVICULA*	27#	40	450#	47	290#	32	410	5	88#	16	100#	50
...NITZSCHIACEAE												
....NITZSCHIA	--	-	64	7	45	5	210	3	180#	32	15	7
...SURIRELLACEAE												
....SURIRELLA	14#	20	48	5	--	-	--	-	--	-	--	-
EUGLENOPHYTA (EUGLENOIDS)												
.EUGLENOPHYCEAE												
..EUGLENALES												
...EUGLENACEAE												
....EUGLENA	--	-	--	-	--	-	1200#	16	--	-	--	-
....LEPOCINCLIS	--	-	--	-	--	-	890	11	--	-	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%
* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01518500 - CROOKED CREEK AT TIOGA, PA.

WATER QUALITY DATA, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	BICAR-BONATE (MG/L AS HCO3)	CAR-BONATE (MG/L AS CO3)	ALKA-LINITY (MG/L AS CACO3)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2)
SEP											
05...	1045	47	184	7.0	23.5	8.2	95	73	0	50	12

DATE	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, ORTHO, TOTAL (MG/L AS P)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT DIS-CHARGE, SUS-PENDED (T/DAY)
SEP											
05...	22	7.0	.79	.11	.33	.44	1.2	.14	.08	64	8.1

WATER QUALITY DATA, WATER YEAR OCTOBER 1973 TO SEPTEMBER 1974

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	ACIDITY TOTAL HEATED (MG/L AS H)	ACIDITY (MG/L AS CACO3)	BICAR-BONATE (MG/L AS HCO3)	CAR-BONATE (MG/L AS CO3)	ALKA-LINITY (MG/L AS CACO3)
OCT												
09...	1615	35	197	6.9	16.5	9.3	94	--	--	89	0	71
NOV												
06...	1300	61	153	7.9	5.0	11.6	91	.0	--	63	0	55
DEC												
11...	1300	292	134	6.8	2.5	12.6	92	.0	--	52	0	36
JAN												
08...	1225	E66	146	6.9	.0	13.0	89	.1	--	50	0	41
FEB												
13...	1710	E68	132	6.4	2.0	13.2	94	.1	--	48	0	36
MAR												
13...	1800	89	111	7.1	2.5	13.6	100	.0	--	32	0	25
APR												
02...	1625	811	117	7.8	6.0	12.4	99	.0	--	34	0	29
MAY												
01...	1545	132	144	7.6	16.0	10.8	108	.0	--	54	0	43
JUN												
12...	1550	26	168	7.5	19.5	8.7	94	.0	12	81	0	62
JUL												
17...	1415	18	190	7.7	23.0	8.6	99	.1	--	86	0	66
AUG												
14...	1550	11	197	8.2	27.0	8.2	101	.0	--	97	0	78
SEP												
12...	1620	10	205	7.8	24.0	8.6	101	.1	--	91	0	78

DATE	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, ORTHO, TOTAL (MG/L AS P)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT DIS-CHARGE, SUS-PENDED (T/DAY)
OCT												
09...	18	15	10	.05	.09	.39	.48	.53	.13	.10	9	.85
NOV												
06...	1.3	18	5.0	.27	.06	.31	.37	.64	.18	.11	56	9.2
DEC												
11...	13	20	1.9	.50	.07	.22	.29	.79	.17	.07	18	14
JAN												
08...	10	20	4.5	.70	.09	.22	.31	1.0	.03	.02	7	1.2
FEB												
13...	31	17	5.0	.70	.05	.19	.24	.94	.08	.00	E0	--
MAR												
13...	4.1	16	1.5	.32	.07	.18	.25	.57	.03	.01	24	5.8
APR												
02...	.9	19	4.0	.60	.12	.66	.78	1.4	.13	.10	789	633
MAY												
01...	2.2	20	4.0	.20	.10	.24	.34	.54	.04	.02	10	3.6
JUN												
12...	4.1	17	5.0	.41	.09	.30	.39	.80	.06	.02	17	1.2
JUL												
17...	2.7	19	5.8	.05	.09	.21	.30	.35	.03	.02	E0	--
AUG												
14...	1.0	17	7.0	.02	.09	.24	.33	.35	.07	.03	30	.89
SEP												
12...	2.3	18	8.0	.07	.07	.16	.23	.30	.07	.04	16	.44

Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01518500 - CROOKED CREEK AT TIOGA, PA.

WATER QUALITY DATA, WATER YEAR OCTOBER 1974 TO SEPTEMBER 1975

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	ACIDITY TOTAL HEATED (MG/L AS H)	ACIDITY (MG/L AS CACO3)	BICAR-BONATE (MG/L AS HCO3)	CAR-BONATE (MG/L AS CO3)	ALKA-LINITY (MG/L AS CACO3)
OCT												
10...	1630	10	221	7.5	15.0	11.6	114	.1	4.0	102	0	83
NOV												
07...	1145	64	185	7.2	8.0	11.4	96	.0	3.0	67	0	54
DEC												
09...	1515	513	128	7.7	2.0	13.8	100	.0	4.0	48	0	45
JAN												
14...	1545	331	114	6.8	.0	14.8	101	.0	3.0	32	0	27
FEB												
03...	1545	--	135	6.9	.5	14.0	97	.0	5.0	46	0	31
MAR												
05...	1515	131	132	7.2	1.0	13.0	92	.0	4.0	40	0	35

DATE	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, ORTHO, TOTAL (MG/L AS P)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT DIS-CHARGE, SUS-PENDED (T/DAY)
OCT												
10...	5.2	19	8.5	.14	.09	.17	.26	.40	.08	.03	18	.49
NOV												
07...	6.8	28	10	--	--	--	--	--	--	--	54	9.3
DEC												
09...	1.5	22	5.0	1.2	.08	.51	.59	1.8	.08	.05	50	69
JAN												
14...	8.1	20	4.0	.57	.04	.29	.33	.90	.07	.04	19	17
FEB												
03...	9.3	20	5.5	.66	.03	.31	.34	1.0	.07	.03	80	--
MAR												
05...	4.0	20	5.0	.88	.01	.25	.26	1.1	.06	.04	10	3.5

DATE	TIME	ALUM-INUM, TOTAL RECOV-ERABLE (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR)	COBALT, TOTAL RECOV-ERABLE (UG/L AS CO)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU)
OCT							
10...	1630	450	<1	1	0	3	0

DATE	IRON, TOTAL RECOV-ERABLE (UG/L AS FE)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	SELE-NIUM, TOTAL (UG/L AS SE)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN)
OCT							
10...	1300	2	130	<.5	2	0	40

Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01518550 - CROOKED CR AT TIOGA, PA.

WATER QUALITY DATA, WATER YEAR OCTOBER 1974 TO SEPTEMBER 1975

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	ACIDITY TOTAL HEATED (MG/L AS H)	ACIDITY (MG/L AS CACO3)
APR									
01...	1445	125	117	7.4	5.5	11.8	93	.0	7.0
MAY									
14...	1530	181	136	7.9	15.0	10.0	98	.1	1.0
JUN									
10...	1545	212	133	7.2	17.0	9.0	93	.0	6.0
JUL									
09...	1200	24	196	8.0	25.5	8.3	100	.0	2.0
AUG									
06...	1500	22	203	7.4	21.5	8.0	90	.1	6.0
SEP									
11...	1220	16	214	8.4	19.0	10.2	109	.0	.0

DATE	BICAR-BONATE (MG/L AS HCO3)	CAR-BONATE (MG/L AS CO3)	ALKA-LINITY (MG/L AS CACO3)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)
APR									
01...	41	0	30	2.6	19	4.5	.50	--	--
MAY									
14...	46	0	42	.9	17	3.5	.19	.03	.22
JUN									
10...	50	0	39	5.0	19	3.0	.50	--	--
JUL									
09...	87	0	73	1.4	19	7.0	.18	--	--
AUG									
06...	93	0	76	5.9	20	9.0	.83	.01	.84
SEP									
11...	90	0	78	.6	20	9.0	.05	--	--

DATE	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, ORTHO, TOTAL (MG/L AS P)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT DIS-CHARGE, SUS-PENDED (T/DAY)
APR								
01...	.02	.28	.30	.80	.16	.11	192	65
MAY								
14...	.04	.47	.51	.73	.61	.02	931	455
JUN								
10...	.01	.41	.42	.92	.14	.09	134	77
JUL								
09...	.05	.27	.32	.50	.16	.08	35	2.3
AUG								
06...	.00	.46	.46	1.3	.04	.04	160	9.5
SEP								
11...	.02	.19	.21	.26	.09	.07	43	1.9

Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01518550 - CROOKED CR AT TIOGA, PA.

WATER QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	ACIDITY TOTAL HEATED (MG/L AS H)	ACIDITY (MG/L AS CACO3)
OCT									
07...	1145	75	182	7.2	13.0	9.6	91	.0	4.0
NOV									
11...	1150	209	152	7.3	10.0	10.6	94	.1	4.0
DEC									
10...	1410	260	131	6.9	1.5	13.0	92	.1	4.0
JAN									
07...	1140	88	161	7.0	.0	14.0	96	.1	3.0
FEB									
05...	0915	111	133	7.6	.0	13.6	93	.1	3.0
MAR									
09...	1015	181	119	7.3	1.0	13.0	92	.0	2.0
APR									
06...	1045	159	125	8.1	7.0	12.8	105	.1	1.0
MAY									
06...	0930	62	158	8.0	13.5	10.9	104	.0	2.0
JUN									
02...	0900	214	138	7.7	14.0	10.0	96	.0	2.0
JUL									
13...	0940	36	194	7.6	18.0	8.4	88	.1	4.0
AUG									
11...	0850	42	192	7.8	18.5	8.8	93	.0	2.0
SEP									
08...	0825	9.1	234	7.8	17.0	8.4	87	.0	2.0

DATE	BICAR-BONATE (MG/L AS HCO3)	CAR-BONATE (MG/L AS CO3)	ALKA-LINITY (MG/L AS CACO3)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)
OCT									
07...	69	0	60	7.0	20	5.5	.70	--	--
NOV									
11...	53	0	43	4.3	18	6.0	.29	--	--
DEC									
10...	46	0	34	9.3	16	6.3	.32	.03	.35
JAN									
07...	57	0	48	9.1	22	5.5	--	--	--
FEB									
05...	46	0	36	1.8	20	4.5	--	--	--
MAR									
09...	36	0	30	2.9	19	4.0	.36	--	--
APR									
06...	46	0	36	.6	18	5.2	--	--	--
MAY									
06...	61	0	51	1.0	17	4.8	--	--	--
JUN									
02...	56	0	48	1.8	14	4.7	.19	.01	.20
JUL									
13...	85	0	70	3.4	17	5.2	--	--	--
AUG									
11...	91	0	74	2.3	20	7.4	--	--	--
SEP									
08...	107	0	88	2.7	22	8.0	.09	.01	.10

Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01518550 - CROOKED CR AT TIOGA, PA.

WATER QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, ORTHO, TOTAL (MG/L AS P)	SEDI-MENT, SUS-PENDED (MG/L)	SEDIMENT DIS-CHARGE, SUS-PENDED (T/DAY)
OCT								
07...	.07	.49	.56	1.3	.30	.13	4500	911
NOV								
11...	.03	.60	.63	.92	.15	.08	108	61
DEC								
10...	.04	.37	.41	.76	.16	.05	169	119
JAN								
07...	--	--	--	--	--	--	E0	--
FEB								
05...	--	--	--	--	--	--	5	1.5
MAR								
09...	.02	.17	.19	.55	.01	.01	8	3.9
APR								
06...	--	--	--	--	--	--	8	3.4
MAY								
06...	--	--	--	--	--	--	12	2.0
JUN								
02...	.01	.29	.30	.50	.05	.02	16	9.2
JUL								
13...	--	--	--	--	--	--	30	2.9
AUG								
11...	--	--	--	--	--	--	17	1.9
SEP								
08...	.02	.11	.13	.23	.05	.01	13	.32

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	ACIDITY TOTAL HEATED (MG/L AS H)	ACIDITY (MG/L AS CACO3)	BICAR-BONATE (MG/L AS HCO3)	CAR-BONATE (MG/L AS CO3)
OCT											
07...	1000	10	259	8.1	15.0	9.9	97	.0	1.0	112	0
NOV											
10...	0845	52	172	7.3	1.0	13.1	92	.1	3.0	67	0
DEC											
14...	1245	--	173	7.0	.0	14.3	98	.1	7.0	55	0
JAN											
12...	1330	--	188	7.2	.0	13.6	93	.1	4.0	79	0
FEB											
08...	1315	--	211	6.8	.0	13.2	90	.1	6.0	85	0
MAR											
07...	1140	226	113	6.6	.5	13.4	93	.1	4.0	29	0
APR											
13...	1240	106	144	8.0	15.0	10.9	107	.0	1.0	47	0
MAY											
02...	1245	88	138	8.3	14.0	11.0	106	.0	.0	49	0
JUN											
09...	1635	18	202	7.9	13.5	10.1	96	.0	2.0	88	0
JUL											
06...	1325	11	240	8.3	27.0	8.0	99	.0	.0	101	0
AUG											
08...	1500	66	226	7.9	25.0	8.1	96	.1	3.0	88	0
SEP											
15...	1355	3.8	240	8.2	19.0	10.6	113	.0	1.0	92	0

Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01518550 - CROOKED CR AT TIOGA, PA.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	ALKALINITY (MG/L AS CACO3)	CARBON DIOXIDE DISSOLVED (MG/L AS CO2)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	NITROGEN, NITRATE TOTAL (MG/L AS N)	NITROGEN, NITRATE DISSOLVED (MG/L AS N)	NITROGEN, NITRITE TOTAL (MG/L AS N)	NITROGEN, NITRITE DISSOLVED (MG/L AS N)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)
OCT											
07...	92	1.4	18	8.8	--	--	--	--	--	--	--
NOV											
10...	55	5.4	21	6.5	--	--	--	--	--	--	--
DEC											
14...	45	8.8	81	8.8	.60	--	.01	--	.61	--	.00
JAN											
12...	65	8.0	17	8.0	--	--	--	--	--	--	--
FEB											
08...	70	22	18	8.2	--	--	--	--	--	--	--
MAR											
07...	24	12	15	5.0	.51	--	.01	--	.52	--	.05
APR											
13...	39	.7	18	5.1	--	--	--	--	--	--	--
MAY											
02...	40	.4	15	4.6	--	--	--	--	--	--	--
JUN											
09...	72	1.8	17	6.8	.14	--	.01	--	.15	--	.02
JUL											
06...	83	.8	20	8.4	--	--	--	--	--	--	--
AUG											
08...	72	1.8	17	9.3	--	--	--	--	--	--	--
SEP											
15...	76	.9	22	10	--	.55	--	.00	--	.55	--

DATE	NITROGEN, AMMONIA DISSOLVED (MG/L AS N)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN, ORGANIC DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC DIS. (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHORUS, DISSOLVED (MG/L AS P)	PHOSPHORUS, ORTHO, TOTAL (MG/L AS P)	SEDIMENT, SUSPENDED (MG/L)	SEDIMENT DISCHARGE, SUSPENDED (T/DAY)
OCT											
07...	--	--	--	--	--	--	--	--	--	10	.27
NOV											
10...	--	--	--	--	--	--	--	--	--	42	5.9
DEC											
14...	--	.35	--	.35	--	.96	.05	--	.01	18	--
JAN											
12...	--	--	--	--	--	--	--	--	--	1	--
FEB											
08...	--	--	--	--	--	--	--	--	--	6	--
MAR											
07...	--	.31	--	.36	--	.88	.05	--	.01	35	21
APR											
13...	--	--	--	--	--	--	--	--	--	8	2.3
MAY											
02...	--	--	--	--	--	--	--	--	--	8	1.9
JUN											
09...	--	.27	--	.29	--	.44	.03	--	.01	23	1.1
JUL											
06...	--	--	--	--	--	--	--	--	--	11	.33
AUG											
08...	--	--	--	--	--	--	--	--	--	301	54
SEP											
15...	.03	--	.42	--	.45	--	--	.07	--	80	.82

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	TIME	STREAMFLOW, INSTANTANEOUS (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	COLIFORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREPTOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARDNESS (MG/L AS CACO3)
OCT										
27...	1310	8.5	155	9.2	12.0	14.3	132	K13	K260	68
FEB										
09...	1245	--	118	7.2	.0	13.7	94	K2	--	50
MAR										
24...	1405	E45	85	7.2	4.5	13.3	103	K3	58	30
MAY										
25...	1510	13	170	9.3	22.5	11.9	136	53	120	44
JUN										
28...	1520	1.2	250	8.4	28.0	10.2	129	--	56	110
JUL										
25...	1715	1.3	240	8.8	22.0	10.3	117	35	50	110
AUG										
24...	1600	.50	240	8.5	29.0	12.4	159	K6	310	110
SEP										
28...	1150	1.2	255	8.4	16.0	13.2	132	K3	160	76

Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01518550 - CROOKED CR AT TIOGA, PA.

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	HARDNESS, NONCARBONATE (MG/L CACO3)	ACIDITY TOTAL HEATED (MG/L AS H)	ACIDITY (MG/L AS CACO3)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)
OCT									
27...	10	.0	.0	22	3.1	2.6	7	.1	1.8
FEB									
09...	20	.0	2.0	16	2.5	4.5	16	.3	1.5
MAR									
24...	13	.1	3.0	9.2	1.6	2.7	16	.2	1.4
MAY									
25...	6	.0	.0	14	2.2	4.0	16	.3	2.0
JUN									
28...	24	.0	.0	36	4.7	7.1	12	.3	2.5
JUL									
25...	25	.0	.0	35	4.7	7.2	12	.3	2.5
AUG									
24...	31	.0	.0	35	5.6	7.6	13	.3	2.5
SEP									
28...	0	.0	.0	20	6.4	7.6	17	.4	2.0

DATE	BICARBONATE (MG/L AS HCO3)	CARBONATE (MG/L AS CO3)	ALKALINITY (MG/L AS CACO3)	CARBON DIOXIDE DISSOLVED (MG/L AS CO2)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	NITROGEN, NITRATE DISSOLVED (MG/L AS N)	NITROGEN, NITRITE DISSOLVED (MG/L AS N)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)
OCT									
27...	59	6	58	.1	20	4.5	.18	.00	.18
FEB									
09...	37	0	30	3.7	18	5.4	.63	.00	.63
MAR									
24...	21	0	17	7.1	14	2.0	.51	.00	.51
MAY									
25...	34	6	38	.0	15	4.6	.16	.00	.16
JUN									
28...	105	0	86	.7	25	10	.57	.01	.58
JUL									
25...	93	5	85	.3	24	9.7	.48	.01	.49
AUG									
24...	92	2	79	.5	27	9.7	.60	.01	.61
SEP									
28...	116	1	97	.8	28	9.5	.37	.01	.38

DATE	NITROGEN, AMMONIA DISSOLVED (MG/L AS N)	NITROGEN, ORGANIC DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC DIS. (MG/L AS N)	PHOSPHORUS, DISSOLVED (MG/L AS P)	PHYTOPLANKTON, TOTAL (CELLS PER ML)	CHLOROPHYLL A PHYTOPLANKTON, UNCORR. (UG/L)	CHLOROPHYLL B PHYTOPLANKTON, UNCORR. (UG/L)	SEDIMENT, SUSPENDED (MG/L)	SEDIMENT DISCHARGE, SUSPENDED (T/DAY)
OCT									
27...	.00	.18	.18	.00	--	--	--	3	.07
FEB									
09...	.00	.27	.27	.04	--	--	--	E15	--
MAR									
24...	.03	.33	.36	.01	42	3.47	1.26	27	--
MAY									
25...	.01	.48	.49	.02	700	.000	.000	9	.32
JUN									
28...	.02	.36	.38	.01	2400	5.02	1.03	3	.01
JUL									
25...	.00	.17	.17	.01	2000	4.29	.000	2	.01
AUG									
24...	.00	.44	.44	.01	1900	3.13	.155	4	.01
SEP									
28...	.03	.00	.03	.00	530	.000	.000	2	.01

Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01518550 CROOKED CR AT TIOGA, PA.
PHYTOPLANKTON ANALYSES, OCTOBER 1977 TO SEPTEMBER 1978

DATE	MAR 24,78		MAY 25,78		JUN 28,78		JUL 25,78		AUG 24,78		SEP 24,78	
TIME	1405		1510		1520		1715		1500		1450	
TOTAL CELLS/ML	42		700		2400		2000		1900		530	
DIVERSITY: DIVISION	0.0		0.3		1.8		1.4		1.5		1.0	
.CLASS	0.0		0.3		1.8		1.4		1.5		1.0	
..ORDER	0.9		0.3		2.0		2.1		2.0		1.2	
...FAMILY	1.6		2.6		3.0		3.1		2.7		2.2	
....GENUS	1.6		2.6		3.2		3.2		3.3		2.8	
ORGANISM	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT
CHLOROPHYTA (GREEN ALGAE)												
.CHLOROPHYCEAE												
..CHLOROCOCCALES												
...MICRACTINIACEAE												
....GOLENKINIA	--	-	--	-	--	-	22	1	15	1	--	-
...OOCYSTACEAE												
....ANKISTRODESMUS	--	-	--	-	130	6	45	2	44	2	15	3
....CHODATELLA	--	-	--	-	67	3	--	-	--	-	--	-
....KIRCHNERIELLA	--	-	--	-	--	-	22	1	--	-	--	-
....OOCYSTIS	--	-	--	-	--	-	--	-	59	3	--	-
....SELENASTRUM	--	-	--	-	22	1	--	-	73	4	15	3
...SCENEDESMACEAE												
....ACTINASTRUM	--	-	--	-	--	-	--	-	--	-	180#	33
....CRUCIGENIA	--	-	--	-	--	-	--	-	15	1	--	-
....SCENEDESMUS	--	-	--	-	630#	26	380#	19	--	-	59	11
....TETRASTRUM	--	-	--	-	22	1	--	-	--	-	--	-
..TETRASPORALES												
...PALMELLACEAE												
....SPHAEROCYSTIS	--	-	--	-	--	-	--	-	120	6	--	-
..VOLVOCALES												
...CHLAMYDOMONADACEAE												
....CHLAMYDOMONAS	--	-	--	-	45	2	180	9	--	-	--	-
..ZYGNEMATALES												
...DESMIDIACEAE												
....COSMARIUM	--	-	--	-	--	-	--	-	--	-	15	3
CHRYSOPHYTA												
.BACILLARIOPHYCEAE												
..CENTRALES												
...COSCINODISCACEAE												
....CYCLOTELLA	14#	33	--	-	22	1	270	14	--	-	--	-
..PENNALES												
...ACHNANTHACEAE												
....ACHNANTHES	--	-	--	-	--	-	490#	25	--	-	--	-
....COCCONEIS	--	-	--	-	--	-	45	2	--	-	59	11
...CYMBELLACEAE												
....CYMBELLA	--	-	140#	20	160	7	89	5	280	15	73	14
...DIATOMACEAE												
....DIATOMA	14#	33	--	-	--	-	--	-	--	-	--	-
...FRAGILARIACEAE												
....FRAGILARIA	--	-	--	-	--	-	--	-	44	2	--	-
....SYNEDRA	--	-	110#	16	180	8	--	-	--	-	--	-
...GOMPHONEMATACEAE												
....GOMPHONEMA	14#	33	64	9	200	8	110	6	29	2	15	3
...MERIDIONACEAE												
....MERIDION	--	-	--	-	22	1	--	-	--	-	--	-
...NAVICULACEAE												
....GYROSIGMA	--	-	--	-	--	-	--	-	--	-	15	3
....NAVICULA	--	-	190#	27	89	4	45	2	130	7	88#	17
....STAURONEIS	--	-	--	-	--	-	--	-	15	1	--	-
...NITZSCHIACEAE												
....NITZSCHIA	--	-	48	7	89	4	67	3	88	5	--	-
...SURIRELLACEAE												
....SURIRELLA	--	-	110#	16	--	-	--	-	--	-	--	-
CRYPTOPHYTA (CRYPTOMONADS)												
.CRYPTOPHYCEAE												
..CRYPTOMONADALES												
...CRYPTOMONADACEAE												
....CRYPTOMONAS	--	-	--	-	--	-	45	2	--	-	--	-
CYANOPHYTA (BLUE-GREEN ALGAE)												
.CYANOPHYCEAE												
..CHROOCOCCALES												
...CHROOCOCCACEAE												
....AGMENELLUM	--	-	--	-	--	-	--	-	350#	19	--	-
....ANACYSTIS	--	-	32	5	560#	24	160	8	430#	23	--	-
..HORMOGONALES												
...OSCILLATORIACEAE												
....OSCILLATORIA	--	-	--	-	--	-	--	-	180	9	--	-
EUGLENOPHYTA (EUGLENOIDS)												
.EUGLENOPHYCEAE												
..EUGLENALES												
...EUGLENACEAE												
....EUGLENA	--	-	--	-	45	2	--	-	--	-	--	-
....TRACHELOMONAS	--	-	--	-	89	4	--	-	--	-	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%
* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01518700 - TIOGA RIVER AT TIOGA JUNCTION, PA.

WATER QUALITY DATA, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	BICAR-BONATE (MG/L AS HCO3)	CAR-BONATE (MG/L AS CO3)	ALKA-LINITY (MG/L AS CAC03)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2)
SEP											
05...	1540	75	276	6.4	27.0	10.2	126	18	0	11	11

DATE	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, ORTHO, TOTAL (MG/L AS P)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT DIS-CHARGE, SUS-PENDED (T/DAY)
SEP											
05...	29	9.1	.41	.12	.13	.25	.66	.08	.02	16	3.2

WATER QUALITY DATA, WATER YEAR OCTOBER 1973 TO SEPTEMBER 1974

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	ACIDITY TOTAL HEATED (MG/L AS H)	ACIDITY (MG/L AS CAC03)	BICAR-BONATE (MG/L AS HCO3)	CAR-BONATE (MG/L AS CO3)	ALKA-LINITY (MG/L AS CAC03)
OCT												
09...	1700	131	252	7.2	16.5	9.8	100	--	--	19	0	16
NOV												
06...	1350	281	185	6.8	5.0	12.1	95	.0	--	13	0	14
DEC												
11...	1500	1300	139	7.0	2.5	12.4	91	.1	--	18	0	15
JAN												
08...	1335	E332	194	5.9	.0	13.8	94	.2	--	10	0	9
FEB												
13...	1620	E300	165	7.2	1.5	13.6	97	.1	--	16	0	13
MAR												
13...	1715	883	133	6.5	2.0	13.6	99	.1	--	9	0	6
APR												
02...	1545	2900	120	7.6	7.0	12.2	100	.0	--	24	0	22
MAY												
01...	1650	610	160	6.9	16.5	9.8	100	.0	--	26	0	19
JUN												
12...	1730	178	171	6.9	20.0	9.2	100	.0	10	24	0	19
JUL												
17...	1300	93	255	6.6	22.0	8.4	96	.1	40	24	0	48
AUG												
14...	1645	52	323	7.0	27.0	8.0	99	.0	--	16	0	14
SEP												
13...	0900	45	328	6.4	21.5	9.0	101	.1	6.0	10	0	10

DATE	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, ORTHO, TOTAL (MG/L AS P)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT DIS-CHARGE, SUS-PENDED (T/DAY)
OCT												
09...	1.9	82	9.1	.18	.07	.25	.32	.50	.06	.02	16	5.7
NOV												
06...	3.3	63	5.0	.34	.11	.31	.42	.76	.06	.02	21	16
DEC												
11...	2.9	40	2.1	.63	.05	.27	.32	.95	.17	.09	41	128
JAN												
08...	20	40	5.1	.90	.12	.17	.29	1.2	.03	.01	21	19
FEB												
13...	1.4	49	5.5	.70	.11	.23	.34	1.0	.03	.02	34	28
MAR												
13...	4.7	35	4.5	.45	.09	.16	.25	.70	.02	.01	27	64
APR												
02...	1.0	25	3.0	1.5	.14	1.3	1.4	2.9	.49	.33	894	7000
MAY												
01...	5.2	45	7.0	.40	.24	.29	.53	.93	.06	.03	57	94
JUN												
12...	4.8	51	6.0	.61	.08	.21	.29	.90	.02	.01	6	2.9
JUL												
17...	9.6	87	7.0	.23	.15	.12	.27	.50	.01	.00	1	.25
AUG												
14...	2.6	123	9.0	.16	.11	.16	.27	.43	.01	.00	4	.56
SEP												
13...	6.4	118	10	.34	.09	.05	.14	.48	.01	.00	E0	--

Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01518700 - TIOGA RIVER AT TIOGA JUNCTION, PA.

WATER QUALITY DATA, WATER YEAR OCTOBER 1973 TO SEPTEMBER 1974

DATE	TIME	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	COBALT, TOTAL RECOVERABLE (UG/L AS CO)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)
FEB								
13...	1620	--	--	--	--	--	--	--
MAR								
13...	1715	--	--	--	--	--	--	--
APR								
02...	1545	--	--	--	--	--	--	--
MAY								
01...	1650	2600	2	0	0	13	20	3500
JUN								
12...	1730	0	1	0	10	16	10	330
JUL								
17...	1300	150	<1	1	0	18	20	40
AUG								
14...	1645	70	0	1	0	34	0	20
SEP								
13...	0900	190	<1	1	<10	75	10	120

DATE	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	SELENIUM, TOTAL (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)
FEB							
13...	0	--	--	--	--	--	--
MAR							
13...	60	--	--	--	--	--	--
APR							
02...	110	--	--	--	--	--	--
MAY							
01...	--	14	930	<.5	0	0	80
JUN							
12...	--	2	1200	<.5	1	1	120
JUL							
17...	--	0	1300	<.5	1	0	130
AUG							
14...	--	1	3000	<.5	0	0	340
SEP							
13...	--	2	3900	<.5	<2	1	580

WATER QUALITY DATA, WATER YEAR OCTOBER 1974 TO SEPTEMBER 1975

DATE	TIME	STREAMFLOW, INSTANTANEOUS (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	ACIDITY TOTAL HEATED (MG/L AS H)	ACIDITY (MG/L AS CACO3)
OCT									
11...	0915	65	329	6.5	10.0	10.0	88	.1	7.0
NOV									
07...	1300	289	194	7.0	8.0	13.2	111	.0	3.0
DEC									
09...	1645	2690	108	7.2	2.0	12.6	91	.0	3.0
JAN									
14...	1700	1250	142	6.9	.0	15.6	107	.1	7.0
FEB									
03...	1645	--	161	6.6	.5	13.6	94	.1	6.0
MAR									
05...	1615	E460	172	6.6	1.0	12.8	90	.1	11
APR									
01...	1545	524	133	7.4	6.0	12.0	96	.0	7.0
MAY									
14...	1645	740	146	7.8	17.0	9.6	99	.1	2.0
JUN									
10...	1645	E740	156	6.9	19.0	9.2	98	.0	4.0
JUL									
09...	1310	E130	223	7.2	25.5	8.9	107	.0	3.0
AUG									
06...	1630	E95	310	6.6	21.5	8.3	93	.1	6.0
SEP									
11...	1400	E74	286	7.2	18.5	9.6	103	.0	2.0

Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01518700 - TIOGA RIVER AT TIOGA JUNCTION, PA.

WATER QUALITY DATA, WATER YEAR OCTOBER 1974 TO SEPTEMBER 1975

DATE	BICARBONATE (MG/L AS HCO3)	CARBONATE (MG/L AS CO3)	ALKALINITY (MG/L AS CACO3)	CARBON DIOXIDE DISSOLVED (MG/L AS CO2)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	NITROGEN, NITRATE TOTAL (MG/L AS N)	NITROGEN, NITRITE TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)
OCT									
11...	10	0	10	5.1	132	10	.23	--	--
NOV									
07...	40	0	34	6.4	53	8.0	.27	--	--
DEC									
09...	23	0	21	2.3	27	4.0	.81	--	--
JAN									
14...	8	0	12	16	51	4.5	.63	--	--
FEB									
03...	10	0	8	40	63	5.0	.75	--	--
MAR									
05...	10	0	9	4.0	64	5.0	.99	--	--
APR									
01...	15	0	16	1.0	42	5.5	.66	--	--
MAY									
14...	26	0	22	.7	35	4.0	.27	.01	.28
JUN									
10...	26	0	20	5.2	42	4.0	.59	--	--
JUL									
09...	26	0	22	2.6	67	7.5	.16	--	--
AUG									
06...	23	0	19	9.2	110	10	.29	.01	.30
SEP									
11...	28	0	27	2.8	80	10	.20	--	--

DATE	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHORUS, ORTHO, TOTAL (MG/L AS P)	SEDIMENT, SUSPENDED (MG/L)	SEDIMENT DISCHARGE, SUSPENDED (T/DAY)
OCT								
11...	.14	.13	.27	.50	.01	.00	E0	--
NOV								
07...	.03	.27	.30	.57	.05	.03	17	13
DEC								
09...	.08	.56	.64	1.4	.15	.09	151	1090
JAN								
14...	.05	.24	.29	.92	.03	.02	18	61
FEB								
03...	.09	.37	.46	1.2	.05	.03	E0	--
MAR								
05...	.02	.25	.27	1.3	.05	.04	52	82
APR								
01...	.01	.20	.21	.87	.03	.02	17	24
MAY								
14...	.01	.19	.20	.48	.08	.02	66	132
JUN								
10...	.03	.34	.37	.96	.08	.05	74	--
JUL								
09...	.03	.11	.14	.30	.02	.01	2	2.5
AUG								
06...	.05	.09	.14	.44	.09	.01	7	3.4
SEP								
11...	.04	.14	.18	.38	.03	.02	13	2.9

Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01518700 - TIOGA RIVER AT TIOGA JUNCTION, PA.

WATER QUALITY DATA, WATER YEAR OCTOBER 1974 TO SEPTEMBER 1975

DATE	TIME	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	ARSENIC DISSOLVED (UG/L AS AS)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CADMIUM DISSOLVED (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	CHROMIUM, DISSOLVED (UG/L AS CR)
OCT									
11...	0915	1700	--	0	--	1	--	0	--
NOV									
07...	1300	960	--	2	--	0	--	0	--
DEC									
09...	1645	2300	--	3	--	0	--	<10	--
JAN									
14...	1700	1500	--	1	--	0	--	0	--
FEB									
03...	1645	1800	--	2	--	0	--	0	--
MAR									
05...	1615	--	--	70	--	0	--	1	--
APR									
01...	1545	--	--	30	--	0	--	0	--
MAY									
14...	1645	--	--	70	--	2	--	0	--
JUN									
10...	1645	--	--	60	--	0	--	1	--
JUL									
09...	1310	--	--	170	--	0	--	0	--
AUG									
06...	1630	--	--	20	--	--	--	--	--
SEP									
11...	1400	--	--	110	--	--	--	--	--

DATE	COBALT, TOTAL RECOVERABLE (UG/L AS CO)	COBALT, DISSOLVED (UG/L AS CO)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	COPPER, DISSOLVED (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	LEAD, DISSOLVED (UG/L AS PB)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)
OCT									
11...	55	--	10	--	40	--	3	--	5700
NOV									
07...	13	--	10	--	1100	--	2	--	770
DEC									
09...	8	--	10	--	4500	--	5	--	470
JAN									
14...	19	--	10	--	1400	--	2	--	1000
FEB									
03...	23	--	10	--	1300	--	4	--	1400
MAR									
05...	--	18	--	10	--	170	--	1	--
APR									
01...	--	11	--	0	--	70	--	0	--
MAY									
14...	--	6	--	0	--	40	--	1	--
JUN									
10...	--	12	--	10	--	40	--	1	--
JUL									
09...	--	17	--	0	--	20	--	1	--
AUG									
06...	--	--	--	--	--	0	--	--	--
SEP									
11...	--	--	--	--	--	0	--	--	--

Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01518700 - TIOGA RIVER AT TIOGA JUNCTION, PA.

WATER QUALITY DATA, WATER YEAR OCTOBER 1974 TO SEPTEMBER 1975

DATE	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	MERCURY DISSOLVED (UG/L AS HG)	SELENIUM, TOTAL (UG/L AS SE)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	SILVER, DISSOLVED (UG/L AS AG)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	ZINC, DISSOLVED (UG/L AS ZN)
OCT									
11...	--	<.5	--	2	--	0	--	530	--
NOV									
07...	--	<.5	--	0	--	0	--	120	--
DEC									
09...	--	<.5	--	0	--	0	--	60	--
JAN									
14...	--	<.5	--	0	--	0	--	90	--
FEB									
03...	--	<.5	--	0	--	0	--	180	--
MAR									
05...	1300	--	<.5	--	1	--	0	--	170
APR									
01...	930	--	<.5	--	0	--	0	--	100
MAY									
14...	530	--	1.3	--	0	--	0	--	30
JUN									
10...	770	--	<.5	--	0	--	0	--	40
JUL									
09...	1500	--	<.5	--	0	--	0	--	100
AUG									
06...	3000	--	--	--	--	--	--	--	210
SEP									
11...	2100	--	--	--	--	--	--	--	200

WATER QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	TIME	STREAMFLOW, INSTANTANEOUS (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	ACIDITY TOTAL HEATED (MG/L AS H)	ACIDITY (MG/L AS CACO3)
OCT									
07...	1330	401	247	6.6	13.0	9.8	92	.1	6.0
NOV									
11...	1300	632	183	6.8	10.5	10.4	93	.1	4.0
DEC									
10...	1515	1410	121	6.5	1.5	13.2	94	.1	6.0
JAN									
07...	1330	E322	208	7.1	.0	13.6	93	.1	7.0
FEB									
05...	1035	E382	163	7.2	.0	13.5	92	.1	5.0
MAR									
09...	1110	747	146	6.6	1.0	13.4	94	.1	3.0
APR									
06...	1145	654	145	6.5	6.0	11.6	93	.1	6.0
MAY									
06...	1120	272	177	7.0	13.5	9.6	91	.1	5.0
JUN									
02...	1000	568	159	7.0	14.0	9.6	92	.1	3.0
JUL									
13...	1115	168	230	6.7	16.5	8.8	89	.1	6.0
AUG									
11...	0945	375	182	6.7	18.0	8.8	93	.1	3.0
SEP									
08...	0925	58	364	6.7	18.0	8.6	90	.0	7.0

Table 24.--Water-quality data collected from September 1975 to September 1978--Continued

01518700 - TIOGA RIVER AT TIOGA JUNCTION, PA.

WATER QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	BICARBONATE (MG/L AS HCO3)	CARBONATE (MG/L AS CO3)	ALKALINITY (MG/L AS CACO3)	CARBON DIOXIDE DISSOLVED (MG/L AS CO2)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	NITROGEN, NITRATE TOTAL (MG/L AS N)	NITROGEN, NITRITE TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)
OCT									
07...	21	0	13	8.4	79	6.0	.77	--	--
NOV									
11...	32	0	25	8.1	44	5.5	.27	--	--
DEC									
10...	26	0	20	13	27	5.5	.36	.02	.38
JAN									
07...	22	0	19	2.8	65	6.0	--	--	--
FEB									
05...	18	0	13	1.8	50	5.5	--	--	--
MAR									
09...	15	0	10	6.0	46	4.0	.59	--	--
APR									
06...	18	0	15	4.1	39	4.4	--	--	--
MAY									
06...	24	0	20	3.8	51	5.1	--	--	--
JUN									
02...	34	0	28	5.4	37	5.0	.24	.01	.25
JUL									
13...	27	0	22	8.6	78	4.8	--	--	--
AUG									
11...	21	0	17	6.7	57	5.3	--	--	--
SEP									
08...	9	0	7	2.9	150	7.5	.35	.01	.36

DATE	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHORUS, ORTHO, TOTAL (MG/L AS P)	SEDIMENT, SUSPENDED (MG/L)	SEDIMENT DISCHARGE, SUSPENDED (T/DAY)
OCT								
07...	.11	.27	.38	1.2	.04	.02	36	39
NOV								
11...	.02	.39	.41	.68	.06	.04	50	85
DEC								
10...	.03	.38	.41	.79	.18	.02	266	1910
JAN								
07...	--	--	--	--	--	--	48	64
FEB								
05...	--	--	--	--	--	--	11	--
MAR								
09...	.06	.18	.24	.83	.01	.01	21	41
APR								
06...	--	--	--	--	--	--	18	27
MAY								
06...	--	--	--	--	--	--	12	9.2
JUN								
02...	.02	.18	.20	.45	.04	.01	12	19
JUL								
13...	--	--	--	--	--	--	8	4.4
AUG								
11...	--	--	--	--	--	--	16	17
SEP								
08...	.05	.00	.05	.41	.01	.01	60	--

DATE	TIME	ALUMINUM, DISSOLVED (UG/L AS AL)	IRON, DISSOLVED (UG/L AS FE)	MANGANESE, DISSOLVED (UG/L AS MN)	ZINC, DISSOLVED (UG/L AS ZN)
OCT					
07...	1330	170	40	2500	240
NOV					
11...	1300	40	50	940	200
DEC					
10...	1515	40	40	360	20

Table 24.--Water quality data collected from September 1975 to September 1978--Continued

01518700 - TIOGA RIVER AT TIOGA JUNCTION, PA.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	ACIDITY TOTAL HEATED (MG/L AS H)	ACIDITY (MG/L AS CACO3)	BICAR-BONATE (MG/L AS HCO3)	CAR-BONATE (MG/L AS CO3)
OCT											
07...	1050	58	352	6.9	15.0	9.5	93	.0	2.0	20	0
NOV											
10...	0950	291	196	6.6	1.0	13.2	93	.2	8.0	23	0
DEC											
14...	1545	1160	193	6.7	.0	13.6	93	.1	5.0	33	0
JAN											
12...	1535	E105	255	6.4	.0	12.4	85	.3	17	23	0
FEB											
09...	1445	856	291	6.1	.0	12.6	86	.4	20	24	0
MAR											
07...	1325	1010	130	6.3	1.5	13.4	103	.1	6.0	10	0
APR											
13...	1510	424	179	6.7	15.5	10.0	99	.1	4.0	16	0
MAY											
02...	1450	379	172	6.8	14.0	10.1	97	.1	5.0	18	0
JUN											
09...	1830	93	265	6.9	13.5	9.9	94	.1	6.0	18	0
JUL											
06...	1515	30	314	6.5	25.5	8.1	98	.1	6.0	8	0
AUG											
08...	1645	134	206	7.7	26.0	8.6	105	.1	3.0	56	0
SEP											
15...	1600	103	305	7.4	17.0	9.6	99	.1	4.0	44	0

DATE	ALKA-LINITY (MG/L AS CACO3)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)
OCT											
07...	16	4.0	120	9.8	--	--	--	--	--	--	--
NOV											
10...	19	9.2	59	6.3	--	--	--	--	--	--	--
DEC											
14...	27	11	48	8.8	.63	--	.01	--	.64	--	.04
JAN											
12...	19	15	82	8.1	--	--	--	--	--	--	--
FEB											
08...	20	31	96	10	--	--	--	--	--	--	--
MAR											
07...	8	8.0	35	4.7	.67	--	.01	--	.68	--	.05
APR											
13...	13	5.1	53	5.3	--	--	--	--	--	--	--
MAY											
02...	15	4.6	51	5.1	--	--	--	--	--	--	--
JUN											
09...	15	3.6	91	8.3	.32	--	.00	--	.32	--	.01
JUL											
06...	7	4.0	120	8.3	--	--	--	--	--	--	--
AUG											
08...	46	1.8	65	9.9	--	--	--	--	--	--	--
SEP											
15...	36	2.8	85	10	--	.31	--	.00	--	.31	--

Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01518700 - TIOGA RIVER AT TIOGA JUNCTION, PA.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	NITROGEN, AMMONIA DISSOLVED (MG/L AS N)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN, ORGANIC DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC DIS. (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	PHOSPHORUS TOTAL (MG/L AS P)	PHOSPHORUS, DISSOLVED (MG/L AS P)	PHOSPHORUS, ORTHO, TOTAL (MG/L AS P)	SEDIMENT, SUSPENDED (MG/L)	SEDIMENT DISCHARGE, SUSPENDED (T/DAY)
OCT											
07...	--	--	--	--	--	--	--	--	--	E0	--
NOV											
10...	--	--	--	--	--	--	--	--	--	14	11
DEC											
14...	--	.16	--	.20	--	.84	.03	--	.01	12	38
JAN											
12...	--	--	--	--	--	--	--	--	--	7	--
FEB											
08...	--	--	--	--	--	--	--	--	--	10	--
MAR											
07...	--	.20	--	.25	--	.93	.03	--	.01	35	95
APR											
13...	--	--	--	--	--	--	--	--	--	44	50
MAY											
02...	--	--	--	--	--	--	--	--	--	10	10
JUN											
09...	--	.07	--	.08	--	.40	.00	--	.00	9	2.4
JUL											
06...	--	--	--	--	--	--	--	--	--	2	.49
AUG											
08...	--	--	--	--	--	--	--	--	--	37	38
SEP											
15...	.07	--	.25	--	.32	--	--	.00	--	40	11

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	TIME	STREAMFLOW, INSTANTANEOUS (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	COLIFORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREPTOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARDNESS (MG/L AS CACO3)
OCT										
27...	1505	549	210	6.3	12.5	10.6	99	K1	K12	78
FEB										
09...	1515	380	180	6.6	.0	14.0	96	0	--	71
MAR										
24...	1715	3960	102	6.4	4.0	13.1	100	K4	740	37
MAY										
25...	1745	1050	150	7.0	18.5	9.4	99	110	50	52
JUN										
28...	1800	173	290	7.2	26.0	8.6	105	--	30	120
JUL										
25...	1920	65	340	7.2	22.0	9.6	109	100	40	140
AUG										
24...	1845	58	340	6.8	25.5	8.8	106	K11	28	150
SEP										
28...	1430	92	290	6.7	16.5	10.1	103	K2	85	140

DATE	HARDNESS, NONCARBONATE (MG/L CACO3)	ACIDITY TOTAL HEATED (MG/L AS H)	ACIDITY (MG/L AS CACO3)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)
OCT									
27...	70	.2	8.0	19	7.4	3.2	8	.2	1.6
FEB									
09...	56	.1	6.0	19	5.6	4.0	11	.2	1.4
MAR									
24...	27	.2	10	10	2.9	2.4	12	.2	1.4
MAY									
25...	35	.1	6.0	14	4.2	3.2	11	.2	1.5
JUN									
28...	110	.0	3.0	28	11	5.3	9	.2	2.0
JUL									
25...	120	.1	3.0	35	13	7.0	10	.3	1.6
AUG									
24...	140	.1	4.0	37	15	6.2	8	.2	2.3
SEP									
28...	130	.1	7.0	32	14	5.6	8	.2	1.8

Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01518700 - TIOGA RIVER AT TIOGA JUNCTION, PA.

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	BICARBONATE (MG/L AS HCO3)	CARBONATE (MG/L AS CO3)	ALKALINITY (MG/L AS CACO3)	CARBON DIOXIDE DISSOLVED (MG/L AS CO2)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	NITROGEN, NITRATE DISSOLVED (MG/L AS N)	NITROGEN, NITRITE DISSOLVED (MG/L AS N)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)
OCT									
27...	10	0	8	8.0	72	4.4	.45	.00	.45
FEB									
09...	18	0	15	7.2	51	5.4	.73	.00	.73
MAR									
24...	12	0	10	7.6	28	2.6	.52	.00	.52
MAY									
25...	21	0	17	9.0	39	4.3	.26	.00	.26
JUN									
28...	16	0	13	1.6	100	7.7	.22	.01	.23
JUL									
25...	27	0	22	2.7	110	8.9	.26	.01	.27
AUG									
24...	16	0	13	4.1	140	8.7	.27	.00	.27
SEP									
28...	16	0	13	5.1	110	8.8	.36	.00	.36

DATE	NITROGEN, AMMONIA DISSOLVED (MG/L AS N)	NITROGEN, ORGANIC DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC DIS, (MG/L AS N)	PHOSPHORUS, DISSOLVED (MG/L AS P)	PHYTOPLANKTON, TOTAL (CELLS PER ML)	CHLOROPHYLL A PHYTOPLANKTON, UNCORR, (UG/L)	CHLOROPHYLL B PHYTOPLANKTON, UNCORR, (UG/L)	SEDIMENT, SUSPENDED (MG/L)	SEDIMENT DISCHARGE, SUSPENDED (T/DAY)
OCT									
27...	.04	.22	.26	.00	--	--	--	17	25
FEB									
09...	.08	.17	.25	.00	--	--	--	6	6.2
MAR									
24...	.06	.51	.57	.00	1300	.000	.000	71	759
MAY									
25...	.01	.32	.33	.00	160	.000	.000	26	74
JUN									
28...	.01	.20	.21	.00	4100	.000	.000	1	.47
JUL									
25...	.02	.07	.09	.00	1300	.000	.000	9	1.6
AUG									
24...	.01	.23	.24	.00	250	.000	.000	7	1.1
SEP									
28...	.05	.00	.05	.00	0	.000	.000	4	.99

Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01518700 TIOGA RIVER AT TIOGA JUNCTION, PA.
PHYTOPLANKTON ANALYSES, OCTOBER 1977 TO SEPTEMBER 1978

DATE	MAR 24,78	MAY 25,78	JUN 28,78	JUL 25,78	AUG 24,78	SEP 28,78
TIME	1715	1745	1800	1920	1845	1430
TOTAL CELLS/ML	1300	160	4100	1300	250	0
DIVERSITY: DIVISION	0.5	1.0	0.4	0.8	0.7	0.0
.CLASS	0.5	1.0	0.4	0.8	0.7	0.0
..ORDER	0.5	2.2	0.4	0.9	0.7	0.0
...FAMILY	0.7	2.2	0.9	1.6	1.3	0.0
....GENUS	0.7	2.2	0.9	1.8	1.3	0.0

ORGANISM	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT
CHLOROPHYTA (GREEN ALGAE)												
.CHLOROPHYCEAE												
..CHLOROCOCCALES												
...OOCYSTACEAE												
....ANKISTRODESMUS	--	-	--	-	36	1	--	-	--	-	--	-
....KIRCHNERIELLA	--	-	--	-	--	-	67	5	--	-	--	-
....SELENASTRUM	--	-	--	-	--	-	89	7	--	-	--	-
...SCENEDESMACEAE												
....SCENEDESMUS	--	-	32#	20	72	2	--	-	--	-	--	-
..TETRASPORALES												
...PALMELLACEAE												
....SPHAEROCYSTIS	--	-	32#	20	--	-	--	-	--	-	--	-
..VOLVOCALES												
...CHLAMYDOMONADACEAE												
....CHLAMYDOMONAS	--	-	16	10	110	3	45	3	--	-	--	-
..ZYGNEMATALES												
...DESMIDIACEAE												
....COSMARIUM	--	-	--	-	--	-	--	-	45#	18	--	-
CHRYSOPHYTA												
.BACILLARIOPHYCEAE												
..CENTRALES												
...COSCINODISCACEAE												
....CYCLOTELLA	--	-	32#	20	--	-	--	-	--	-	--	-
..PENNALES												
...ACHNANTHACEAE												
....ACHNANTHES	--	-	--	-	3600#	88	920#	71	160#	64	--	-
...CYMBELLACEAE												
....CYMBELLA	--	-	--	-	110	3	45	3	--	-	--	-
...FRAGILARIACEAE												
....SYNEDRA	--	-	--	-	72	2	22	2	--	-	--	-
...GOMPHONEMATACEAE												
....GOMPHONEMA	68	5	--	-	--	-	--	-	--	-	--	-
...MERIDIONACEAE												
....MERIDION	14	1	--	-	--	-	--	-	--	-	--	-
...NAVICULACEAE												
....NAVICULA	41	3	48#	30	36	1	22	2	45#	18	--	-
...NITZSCHIACEAE												
....NITZSCHIA	27	2	--	-	36	1	22	2	--	-	--	-
...SURIRELLACEAE												
....SURIRELLA	--	-	--	-	--	-	22	2	--	-	--	-
CYANOPHYTA (BLUE-GREEN ALGAE)												
.CYANOPHYCEAE												
..HORMOGONALES												
...OSCILLATORIACEAE												
....OSCILLATORIA	1200#	89	--	-	--	-	--	-	--	-	--	-
EUGLENOPHYTA (EUGLENOIDS)												
.EUGLENOPHYCEAE												
..EUGLENALES												
...EUGLENACEAE												
....EUGLENA	--	-	--	-	36	1	22	2	--	-	--	-
....TRACHELOMONAS	--	-	--	-	--	-	22	2	--	-	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%
* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01518850 - COWANESQUE RIVER AT WESTFIELD, PA.

WATER QUALITY DATA

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	ACIDITY TOTAL HEATED (MG/L AS H)	ACIDITY (MG/L AS CACO3)	BICAR-BONATE (MG/L AS HCO3)	CAR-BONATE (MG/L AS CO3)	ALKA-LINITY (MG/L AS CACO3)
SEP , 1973												
04...	1330	6.8	204	6.9	27.0	11.0	135	--	--	71	0	48
OCT												
10...	1625	7.7	162	8.5	17.5	10.3	107	.0	.0	68	2	57
NOV												
07...	1000	28	130	7.3	4.0	11.9	91	.1	--	43	0	35
DEC												
12...	1045	63	114	6.9	1.5	13.4	96	.1	--	31	0	25
JAN , 1974												
09...	1230	--	113	6.4	.0	14.2	97	.1	--	31	0	23
FEB												
14...	0945	--	109	6.9	.5	13.8	96	.0	--	30	0	25
MAR												
14...	0945	77	95	6.8	.5	13.6	94	.0	--	24	0	17
APR												
03...	0830	272	88	6.4	2.5	12.7	93	.0	--	18	0	14
MAY												
02...	0900	51	107	7.4	7.5	12.6	105	.0	--	37	0	28
JUN												
13...	0920	8.0	138	7.4	14.5	10.2	99	.0	12	60	0	46
JUL												
18...	0920	7.4	143	7.4	19.0	9.4	100	.0	9.0	56	0	46
AUG												
15...	0930	3.1	154	7.5	18.0	9.5	100	.0	--	70	0	59

DATE	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, ORTHO, TOTAL (MG/L AS P)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT DIS-CHARGE, SUS-PENDED (T/DAY)
SEP , 1973												
04...	14	23	19	.18	.21	.32	.53	.71	.06	.04	16	.29
OCT												
10...	.4	14	10	.07	.03	.19	.22	.29	.02	.01	2	.04
NOV												
07...	3.4	18	5.0	.43	.06	.24	.30	.73	.01	.01	1	.08
DEC												
12...	6.2	18	2.0	.48	.08	.19	.27	.75	.01	.01	E0	--
JAN , 1974												
09...	20	16	4.0	.70	.10	.20	.30	1.0	.01	.01	2	--
FEB												
14...	6.0	16	5.5	.80	.04	.36	.40	1.2	.01	.01	6	--
MAR												
14...	6.1	14	2.5	.45	.05	.23	.28	.73	.01	.01	E0	--
APR												
03...	11	17	2.0	1.0	.03	.23	.26	1.3	.05	.04	21	15
MAY												
02...	2.4	18	3.2	.10	.12	.19	.31	.71	.02	.00	2	.28
JUN												
13...	3.8	12	4.0	.63	.04	.18	.22	.85	.01	.00	1	.02
JUL												
18...	3.6	15	4.7	.09	.07	.22	.29	.38	.01	.00	0	.00
AUG												
15...	3.5	13	6.0	.05	.13	.19	.32	.37	.01	.00	4	.03

Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01518860 - MILL CREEK AT WESTFIELD, PA.

WATER QUALITY DATA

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	ACIDITY TOTAL HEATED (MG/L AS H)	ACIDITY (MG/L AS CACO3)	BICAR-BONATE (MG/L AS HCO3)	CAR-BONATE (MG/L AS CO3)	ALKA-LINITY (MG/L AS CACO3)
SEP , 1973												
04...	1445	5.0	234	8.7	29.0	11.2	143	.0	.0	83	4	65
OCT												
10...	1540	4.2	213	9.4	17.5	11.0	115	.0	.0	76	11	72
NOV												
07...	1045	9.5	173	7.5	5.0	12.0	94	.0	--	64	0	52
DEC												
12...	1150	18	170	6.7	2.5	13.2	97	.0	--	52	0	44
JAN , 1974												
09...	1155	--	226	6.3	.5	14.0	97	.0	--	63	0	51
FEB												
14...	1020	--	177	6.2	.5	13.8	96	.2	--	59	0	49
MAR												
14...	1035	23	147	7.3	.5	13.6	94	.0	--	44	0	35
APR												
03...	0940	59	129	6.5	3.0	12.8	95	.0	--	34	0	30
MAY												
02...	1000	9.5	198	8.5	9.0	13.4	116	.0	.0	69	3	56
JUN												
13...	1030	1.2	368	8.2	15.5	10.0	99	.0	--	124	6	107
JUL												
18...	0955	2.0	254	8.6	20.0	10.4	113	.0	.0	91	9	75
AUG												
15...	1030	2.0	275	8.5	19.0	11.0	117	.0	.0	88	9	83

DATE	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, ORTHO, TOTAL (MG/L AS P)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT DIS-CHARGE, SUS-PENDED (T/DAY)
SEP , 1973												
04...	.3	27	15	.20	.21	.44	.65	.85	.11	.09	10	.13
OCT												
10...	.1	17	14	.09	.03	.25	.28	.37	.03	.02	26	.29
NOV												
07...	3.2	20	10	.36	.14	.31	.45	.81	.08	.06	10	.26
DEC												
12...	17	24	10	.61	.10	.38	.48	1.1	.05	.04	E0	--
JAN , 1974												
09...	51	24	23	.80	.27	.33	.60	1.4	.06	.06	5	--
FEB												
14...	60	21	12	.80	.23	.48	.71	1.5	.12	.10	E0	--
MAR												
14...	3.5	17	8.0	.77	.17	.36	.53	1.3	.10	.06	27	1.7
APR												
03...	17	20	5.0	1.0	.09	.41	.50	1.5	.14	.05	25	4.0
MAY												
02...	.4	25	12	.30	.23	.39	.62	.92	.12	.08	3	.08
JUN												
13...	1.4	32	36	1.0	.17	.34	.51	1.5	.19	.18	2	.01
JUL												
18...	.4	20	20	.50	.13	.40	.53	1.0	.09	.07	0	.00
AUG												
15...	.5	19	26	.63	.21	.42	.63	1.3	.09	.07	4	.02

Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01518870 - COWANESQUE RIVER AT COWANESQUE, PA.

WATER QUALITY DATA

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	ACIDITY TOTAL HEATED (MG/L AS H)	ACIDITY (MG/L AS CACO3)	BICAR-BONATE (MG/L AS HCO3)	CAR-BONATE (MG/L AS CO3)	ALKA-LINITY (MG/L AS CACO3)
SEP , 1973												
04...	1545	15	395	8.6	30.5	9.2	122	.0	.0	103	0	73
OCT												
10...	1445	16	389	8.7	17.0	8.7	90	.0	.0	108	3	89
NOV												
07...	1140	50	170	7.5	5.0	12.3	96	.0	--	55	0	47
DEC												
12...	1250	117	144	6.8	2.5	13.6	100	.0	--	42	0	35
JAN , 1974												
09...	1115	--	228	6.4	.0	13.6	93	.2	--	49	0	42
FEB												
14...	1045	--	148	6.6	.5	14.0	97	.1	--	38	0	33
MAR												
14...	1130	170	145	7.2	1.0	13.5	95	.1	--	35	0	22
APR												
03...	1025	540	114	6.5	3.0	12.5	93	.0	--	27	0	22
MAY												
02...	1100	76	212	8.3	9.0	12.4	107	.0	.0	46	0	36
JUN												
13...	1130	12	267	8.5	17.0	11.4	118	.0	.0	82	4	71
JUL												
18...	1030	12	469	8.0	21.0	7.6	84	.1	--	102	0	81
AUG												
15...	1120	7.6	572	7.8	20.0	8.4	91	.1	--	130	0	110

DATE	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, ORTHO, TOTAL (MG/L AS P)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT DIS-CHARGE, SUS-PENDED (T/DAY)
SEP , 1973												
04...	.4	54	56	.29	.35	.49	.84	1.1	.14	.08	11	.45
OCT												
10...	.4	29	54	.11	.07	.19	.21	.32	.01	.00	3	.13
NOV												
07...	2.8	20	12	.50	.18	.25	.43	.93	.03	.02	1	.13
DEC												
12...	11	20	9.0	.57	.11	.19	.30	.87	.03	.01	E0	--
JAN , 1974												
09...	31	26	25	.80	.52	.52	1.0	1.8	.04	.03	2	--
FEB												
14...	15	19	12	.70	.18	.46	.64	1.3	.05	.03	6	--
MAR												
14...	3.5	17	11	.57	.24	.36	.60	1.2	.05	.03	10	4.6
APR												
03...	14	18	4.0	1.0	.15	.48	.63	1.6	.14	.04	32	47
MAY												
02...	.4	26	23	.10	.34	.64	.98	1.1	.04	.02	1	.21
JUN												
13...	.5	23	30	.45	.16	.23	.39	.84	.03	.02	2	.06
JUL												
18...	1.6	48	76	.18	.59	.72	1.3	1.5	.10	.04	2	.06
AUG												
15...	3.3	46	93	.20	.59	.81	1.4	1.6	.12	.07	10	.21

Table 24.--Water-quality data collected from September 1973 to September 1978--*Continued*

01519000 - TROUPS CREEK AT KNOXVILLE, PA.

WATER QUALITY DATA

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	ACIDITY TOTAL HEATED (MG/L AS H)	ACIDITY (MG/L AS CACO3)	BICAR-BONATE (MG/L AS HCO3)	CAR-BONATE (MG/L AS CO3)	ALKA-LINITY (MG/L AS CACO3)
SEP , 1973												
04...	1645	6.5	216	8.8	30.0	9.7	128	.0	.0	93	2	69
OCT												
10...	1320	5.3	239	8.2	16.0	10.7	107	.0	--	116	1	97
NOV												
07...	1310	22	222	7.6	5.0	12.2	95	.0	--	90	0	75
DEC												
13...	0900	44	191	7.2	.5	14.3	99	.0	--	65	0	57
JAN , 1974												
09...	1025	--	194	6.5	.0	14.4	99	.2	--	63	0	52
FEB												
14...	1125	--	140	6.2	.5	14.2	99	.1	--	49	0	40
MAR												
14...	1745	109	140	7.4	3.5	12.8	96	.1	--	44	0	32
APR												
03...	1145	312	124	6.1	4.5	12.5	96	.0	--	32	0	27
MAY												
02...	1230	39	169	8.6	13.0	12.0	113	.0	.0	66	4	55
JUN												
13...	1230	5.6	213	8.0	21.0	--	--	.0	--	92	5	86
JUL												
18...	1100	3.7	232	8.7	22.0	10.0	114	.0	.0	102	2	85
AUG												
15...	1240	2.6	219	8.5	24.0	10.6	125	.0	.0	88	5	84

DATE	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, ORTHO, TOTAL (MG/L AS P)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT DIS-CHARGE, SUS-PENDED (T/DAY)
SEP , 1973												
04...	.2	30	6.6	.20	.05	.61	.57	.86	.01	.01	13	.23
OCT												
10...	1.2	22	12	.06	.02	.32	.34	1.0	.01	.01	5	.07
NOV												
07...	3.6	27	8.0	1.2	.09	.68	.77	2.0	.01	.00	4	.24
DEC												
13...	6.6	26	8.0	.90	.04	.19	.23	1.1	.02	.00	E0	--
JAN , 1974												
09...	32	26	6.5	1.8	.10	.22	.32	2.1	.02	.02	3	--
FEB												
14...	49	20	7.5	.90	.02	.42	.44	1.3	.07	.02	15	--
MAR												
14...	2.8	16	5.0	1.4	.06	.33	.39	1.8	.11	.04	69	20
APR												
03...	41	20	4.0	1.7	.14	.54	.68	2.4	.11	.05	63	53
MAY												
02...	.3	23	5.2	.20	.09	.26	.34	.54	.02	.00	1	.11
JUN												
13...	1.6	20	7.5	.50	.06	.21	.27	.77	.01	.00	1	.02
JUL												
18...	.3	19	7.6	.34	.06	.28	.34	.68	.01	.00	0	.00
AUG												
15...	.5	20	9.0	.23	.07	.19	.26	.49	.01	.00	4	.03

Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01519500 - COWANESQUE RIVER AT NELSON, PA.

WATER QUALITY DATA, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	ACIDITY TOTAL HEATED (MG/L AS H)	BICAR-BONATE (MG/L AS HCO3)	CAR-BONATE (MG/L AS CO3)	ALKA-LINITY (MG/L AS CACO3)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2)
SEP												
05...	1145	55	264	8.0	25.0	10.8	129	.0	100	0	69	1.6

DATE	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, ORTHO, TOTAL (MG/L AS P)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT DIS-CHARGE, SUS-PENDED (T/DAY)
SEP											
05...	25	20	.61	.20	.63	.83	1.4	.12	.08	55	8.2

WATER QUALITY DATA, WATER YEAR OCTOBER 1973 TO SEPTEMBER 1974

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	ACIDITY TOTAL HEATED (MG/L AS H)	ACIDITY (MG/L AS CACO3)	BICAR-BONATE (MG/L AS HCO3)	CAR-BONATE (MG/L AS CO3)	ALKA-LINITY (MG/L AS CACO3)
OCT												
10...	1100	48	327	7.4	16.0	9.6	96	--	--	116	0	82
NOV												
07...	1415	129	220	7.8	4.5	12.6	97	.0	--	77	0	62
DEC												
12...	1615	317	179	7.2	2.0	13.6	99	.0	--	56	0	49
JAN												
09...	0920	--	224	6.8	.0	15.2	104	.2	--	64	0	55
FEB												
14...	1330	--	166	6.9	.5	14.1	98	.0	--	52	0	42
MAR												
14...	1615	319	171	7.2	4.0	13.2	101	.0	--	44	0	39
APR												
03...	1400	1430	133	6.4	7.0	12.4	101	.0	--	34	0	28
MAY												
02...	1630	190	195	8.9	15.0	11.4	112	.0	.0	68	9	51
JUN												
13...	1415	32	276	8.5	22.5	--	--	.0	.0	85	9	82
JUL												
18...	1415	29	310	9.3	27.5	11.4	142	.0	.0	78	12	79
AUG												
15...	1355	17	364	8.7	26.0	10.8	132	.0	.0	90	5	81

DATE	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, ORTHO, TOTAL (MG/L AS P)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT DIS-CHARGE, SUS-PENDED (T/DAY)
OCT												
10...	7.4	28	9.8	.14	.31	.50	.81	.95	.08	.04	2	.26
NOV												
07...	2.0	24	16	.59	.09	.35	.44	1.0	.05	.03	2	.70
DEC												
12...	5.7	25	16	.61	.03	.20	.23	.84	.06	.04	E0	--
JAN												
09...	16	27	13	1.9	.17	.35	.52	2.4	.05	.04	2	--
FEB												
14...	10	20	12	.80	.14	.48	.62	1.4	.06	.04	15	--
MAR												
14...	4.4	20	11	.99	.12	.32	.44	1.4	.03	.03	11	9.5
APR												
03...	22	19	5.5	1.3	.10	.48	.58	1.9	.10	.05	31	120
MAY												
02...	.2	22	13	.01	.09	.33	.42	.52	.03	.01	1	.51
JUN												
13...	.5	31	24	.36	.31	.56	.87	1.2	.04	.02	6	.52
JUL												
18...	.1	33	34	.02	.08	.34	.42	.44	.02	.01	1	.08
AUG												
15...	.3	38	47	.14	.19	.47	.66	.80	.04	.02	8	.37

Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01519500 - COWANESQUE RIVER AT NELSON, PA.

WATER QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	ACIDITY TOTAL HEATED (MG/L AS H)	ACIDITY (MG/L AS CACO3)
APR									
06...	1250	--	170	8.3	7.5	13.2	110	--	.0
MAY									
06...	1215	139	206	8.2	14.5	10.8	105	.1	.0
JUN									
02...	1120	389	155	7.7	14.5	9.5	94	.2	2.0
JUL									
13...	1200	77	258	7.9	16.5	9.3	94	.0	2.0
AUG									
11...	1025	80	286	8.2	19.5	9.3	100	.0	1.0
SEP									
08...	1025	16	393	8.3	18.5	10.2	108	.0	.0

DATE	BICAR-BONATE (MG/L AS HCO3)	CAR-BONATE (MG/L AS CO3)	ALKA-LINITY (MG/L AS CACO3)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)
APR									
06...	--	--	43	--	--	--	--	--	--
MAY									
06...	68	0	57	.7	23	12	--	--	--
JUN									
02...	63	0	55	2.0	16	5.1	.38	.03	.41
JUL									
13...	97	0	80	2.0	32	12	--	--	--
AUG									
11...	102	0	84	1.0	27	19	--	--	--
SEP									
08...	119	0	98	1.0	43	39	.12	.03	.15

DATE	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, ORTHO, TOTAL (MG/L AS P)	ALGAL GROWTH POTEN-TIAL, BOTTLE TEST (MG/L)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT DIS-CHARGE, SUS-PENDED (T/DAY)
APR									
06...	--	--	--	--	--	--	1.2	--	--
MAY									
06...	--	--	--	--	--	--	.7	7	2.6
JUN									
02...	.04	.89	.93	1.3	.11	.03	--	116	122
JUL									
13...	--	--	--	--	--	--	--	4	.83
AUG									
11...	--	--	--	--	--	--	--	7	1.5
SEP									
08...	.03	.37	.40	.55	.03	.01	--	60	--

Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01519500 - COWANESQUE RIVER AT NELSON, PA.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	ACIDITY TOTAL HEATED (MG/L AS H)	ACIDITY (MG/L AS CACO3)	BICAR-BONATE (MG/L AS HCO3)	CAR-BONATE (MG/L AS CO3)
OCT											
07...	1120	18	345	8.4	15.0	11.4	118	.0	.0	117	1
NOV											
10...	1045	115	220	8.0	1.0	13.9	98	.0	2.0	73	0
DEC											
15...	0815	--	200	6.8	.0	13.6	93	.1	6.0	65	0
JAN											
13...	1015	--	270	6.8	.0	12.6	86	.2	8.0	85	0
FEB											
08...	1555	--	339	6.8	.0	12.7	87	.2	8.0	90	0
MAR											
07...	1410	490	136	7.1	1.5	13.6	97	.0	2.0	37	0
APR											
13...	1600	210	184	8.7	16.0	10.8	108	.0	.0	50	4
MAY											
03...	0845	133	198	7.2	10.5	11.1	99	.1	4.0	63	0
JUN											
10...	0905	193	294	7.7	12.0	10.2	94	.1	3.0	88	0
JUL											
07...	0830	E1200	135	7.4	19.5	8.2	88	.1	5.0	41	0
AUG											
09...	0830	204	154	8.0	21.5	8.6	97	.0	2.0	73	0
SEP											
16...	0835	190	225	7.8	15.0	9.7	95	.1	3.0	74	0

DATE	ALKA-LINITY (MG/L AS CACO3)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)
OCT											
07...	97	.8	43	49	--	--	--	--	--	--	--
NOV											
10...	60	1.2	29	14	--	--	--	--	--	--	--
DEC											
15...	53	16	25	12	.75	--	.01	--	.76	--	.00
JAN											
13...	70	22	31	21	--	--	--	--	--	--	--
FEB											
08...	74	23	37	33	--	--	--	--	--	--	--
MAR											
07...	30	4.7	18	7.0	.76	--	.04	--	.80	--	.06
APR											
13...	41	.2	23	11	--	--	--	--	--	--	--
MAY											
03...	52	6.4	22	11	--	--	--	--	--	--	--
JUN											
10...	72	2.8	27	26	.63	--	.04	--	.67	--	.09
JUL											
07...	34	2.6	13	5.3	--	--	--	--	--	--	--
AUG											
09...	60	1.2	17	11	--	--	--	--	--	--	--
SEP											
16...	61	1.9	20	15	--	.62	--	.01	--	.63	--

Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01519500 - COWANESQUE RIVER AT NELSON, PA.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	NITROGEN, AMMONIA DISSOLVED (MG/L AS N)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN, ORGANIC DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC DIS. (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHORUS, DISSOLVED (MG/L AS P)	PHOSPHORUS, ORTHO, TOTAL (MG/L AS P)	SEDIMENT, SUSPENDED (MG/L)	SEDIMENT DISCHARGE, SUSPENDED (T/DAY)
OCT											
07...	--	--	--	--	--	--	--	--	--	E0	--
NOV											
10...	--	--	--	--	--	--	--	--	--	7	2.2
DEC											
15...	--	.20	--	.20	--	.96	.02	--	.01	3	--
JAN											
13...	--	--	--	--	--	--	--	--	--	E0	--
FEB											
08...	--	--	--	--	--	--	--	--	--	1	--
MAR											
07...	--	.35	--	.41	--	1.2	.04	--	.01	20	26
APR											
13...	--	--	--	--	--	--	--	--	--	4	2.3
MAY											
03...	--	--	--	--	--	--	--	--	--	4	1.4
JUN											
10...	--	.67	--	.76	--	1.4	.16	--	.01	130	68
JUL											
07...	--	--	--	--	--	--	--	--	--	612	--
AUG											
09...	--	--	--	--	--	--	--	--	--	28	15
SEP											
16...	.03	--	.41	--	.44	--	--	.13	--	57	29

Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01520000 - COWANESQUE RIVER NR. LAWRENCEVILLE, PA.

WATER QUALITY DATA, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	ACIDITY TOTAL HEATED (MG/L AS H)	BICAR-BONATE (MG/L AS HCO3)	CAR-BONATE (MG/L AS CO3)	ALKA-LINITY (MG/L AS CACO3)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2)
SEP												
05...	1345	70	241	8.1	27.0	11.2	138	.0	87	0	59	1.1

DATE	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, ORTHO, TOTAL (MG/L AS P)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT DIS-CHARGE, SUS-PENDED (T/DAY)
SEP											
05...	23	19	.45	.27	.56	.83	1.3	.20	.10	51	9.6

WATER QUALITY DATA, WATER YEAR OCTOBER 1973 TO SEPTEMBER 1974

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	ACIDITY TOTAL HEATED (MG/L AS H)	ACIDITY (MG/L AS CACO3)	BICAR-BONATE (MG/L AS HCO3)	CAR-BONATE (MG/L AS CO3)	ALKA-LINITY (MG/L AS CACO3)
OCT												
09...	1740	63	309	9.0	18.0	10.6	112	.0	.0	91	12	85
NOV												
06...	1510	148	223	7.8	5.0	12.1	95	.0	--	77	0	63
DEC												
12...	1510	287	176	6.8	2.5	13.6	100	.0	1.0	47	0	38
JAN												
08...	1545	E170	205	6.4	.0	14.2	97	.1	4.0	59	0	48
FEB												
14...	1430	E170	164	6.9	.5	14.4	100	.1	4.0	50	0	41
MAR												
14...	1450	317	158	7.3	3.5	13.9	104	.1	4.0	52	0	43
APR												
03...	1625	1400	124	6.3	6.5	12.2	99	.0	2.0	30	0	25
MAY												
02...	1530	215	189	9.1	15.5	13.2	131	.0	.0	64	6	57
JUN												
13...	1535	E42	274	8.7	24.0	--	--	.0	.0	78	12	74
JUL												
18...	1340	29	300	8.8	27.0	9.2	114	.0	.0	92	2	77
AUG												
15...	1500	17	337	8.5	28.0	9.2	116	.0	.0	96	2	80
SEP												
13...	0930	30	347	7.8	21.0	9.0	100	.1	5.0	100	0	82

DATE	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, ORTHO, TOTAL (MG/L AS P)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT DIS-CHARGE, SUS-PENDED (T/DAY)
OCT												
09...	.2	26	35	.05	.01	.16	.17	.22	.02	.02	E0	--
NOV												
06...	2.0	25	17	.54	.12	.29	.41	.95	.04	.02	9	3.6
DEC												
12...	12	25	16	.63	.03	.18	.21	.84	.06	.04	E0	--
JAN												
08...	38	26	14	1.0	.13	.38	.51	1.5	.04	.03	5	2.3
FEB												
14...	10	20	12	.80	.08	.36	.44	1.2	.08	.04	E0	--
MAR												
14...	4.2	20	9.2	.84	.10	.28	.38	1.2	.04	.02	22	19
APR												
03...	24	20	5.0	1.0	.12	.47	.59	1.6	.10	.05	52	197
MAY												
02...	.1	21	12	.10	.08	.27	.35	.45	.03	.01	2	1.2
JUN												
13...	.3	25	24	.27	.13	.31	.44	.71	.02	.01	2	.23
JUL												
18...	.2	31	29	.07	.06	.27	.33	.40	.02	.01	2	.16
AUG												
15...	.5	32	38	.09	.09	.30	.39	.48	.03	.01	5	.23
SEP												
13...	2.5	33	39	.09	.08	.24	.32	.41	.02	.01	E0	--

Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01520000 - COWANESQUE RIVER NR. LAWRENCEVILLE, PA.

WATER QUALITY DATA, WATER YEAR OCTOBER 1974 TO SEPTEMBER 1975

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	ACIDITY TOTAL HEATED (MG/L AS H)	ACIDITY (MG/L AS CACO3)
OCT									
11...	1010	31	352	7.9	9.0	11.4	98	.0	2.0
NOV									
07...	1430	215	212	7.2	8.0	14.4	121	.0	6.0
DEC									
10...	0930	573	148	7.6	.0	13.8	95	.0	4.0
JAN									
15...	0930	417	157	7.1	.0	--	--	.0	1.0
FEB									
04...	0945	E190	163	7.7	.0	14.4	99	.0	4.0
MAR									
06...	0840	E280	164	7.4	1.0	12.8	90	.0	2.0
APR									
02...	0900	304	144	7.8	3.5	12.0	90	.0	2.0
MAY									
15...	0900	261	164	8.3	14.0	10.2	98	.1	.0
JUN									
10...	1730	479	158	7.6	19.5	9.6	103	.0	3.0
JUL									
10...	0900	105	194	7.3	18.0	7.5	79	.0	4.0
AUG									
07...	0915	82	310	7.8	17.5	9.6	100	.1	4.0
SEP									
11...	1455	42	305	8.8	22.0	11.2	127	.0	.0

DATE	BICAR-BONATE (MG/L AS HCO3)	CAR-BONATE (MG/L AS CO3)	ALKA-LINITY (MG/L AS CACO3)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)
OCT									
11...	107	0	90	2.2	35	37	.05	--	--
NOV									
07...	70	0	54	7.1	30	15	.34	--	--
DEC									
10...	48	0	52	1.9	26	8.0	.81	--	--
JAN									
15...	42	0	33	5.3	26	9.0	1.0	--	--
FEB									
04...	48	0	39	1.5	21	10	.95	--	--
MAR									
06...	44	0	39	2.8	26	10	1.2	--	--
APR									
02...	44	0	37	1.1	25	9.5	.77	--	--
MAY									
15...	55	0	45	.4	23	7.5	.09	.01	.10
JUN									
10...	54	0	43	2.2	20	6.5	.81	--	--
JUL									
10...	66	0	51	5.3	23	11	.75	--	--
AUG									
07...	110	0	90	2.8	29	27	.20	.01	.21
SEP									
11...	92	5	88	.3	24	30	.05	--	--

Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01520000 - COWANESQUE RIVER NR. LAWRENCEVILLE, PA.

WATER QUALITY DATA, WATER YEAR OCTOBER 1974 TO SEPTEMBER 1975

DATE	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHORUS, ORTHO, TOTAL (MG/L AS P)	SEDIMENT, SUSPENDED (MG/L)	SEDIMENT DISCHARGE, SUSPENDED (T/DAY)
OCT								
11...	.05	.22	.27	.32	.01	.00	E0	--
NOV								
07...	.00	.35	.35	.69	.04	.02	4	2.3
DEC								
10...	.09	.41	.50	1.3	.04	.03	8	12
JAN								
15...	.07	.55	.62	1.6	.06	.04	3	3.4
FEB								
04...	.08	.49	.57	1.5	.04	.02	E0	--
MAR								
06...	.04	.36	.40	1.6	.04	.02	4	3.4
APR								
02...	.00	.30	.30	1.1	.04	.02	5	4.1
MAY								
15...	.00	.17	.17	.27	.02	.01	6	4.2
JUN								
10...	.01	.33	.34	1.2	.04	.03	5	6.5
JUL								
10...	.08	.75	.83	1.6	.19	.09	77	22
AUG								
07...	.00	.26	.26	.47	.01	.01	E0	--
SEP								
11...	.04	.21	.25	.30	.02	.01	E0	--

WATER QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	TIME	STREAMFLOW, INSTANTANEOUS (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	ACIDITY TOTAL HEATED (MG/L AS H)	ACIDITY (MG/L AS CACO3)
OCT									
07...	1430	155	241	7.2	14.0	10.2	98	.0	4.0
NOV									
11...	1435	521	182	7.1	10.5	10.3	92	.1	4.0
DEC									
11...	0810	452	168	7.2	1.0	12.9	91	.1	6.0
JAN									
07...	1430	E210	220	7.2	.0	14.4	99	.0	5.0
FEB									
05...	1145	E255	175	6.7	.0	13.8	95	.0	2.0
MAR									
09...	1200	410	150	7.1	1.0	13.6	96	.0	1.0
APR									
06...	1335	E320	165	9.1	8.0	16.1	135	.0	.0
MAY									
06...	1330	159	190	8.5	15.5	11.8	117	.1	.0
JUN									
02...	1225	428	152	7.3	15.5	9.0	89	.5	2.0
JUL									
13...	1255	92	251	8.1	17.0	9.8	101	.0	1.0
AUG									
11...	1120	85	262	8.3	20.5	9.6	106	.0	.0
SEP									
08...	1140	17	375	8.2	20.5	9.0	99	.0	1.0

Table 24.--*Water-quality data collected from September 1973 to September 1978* Continued

01520000 - COWANESQUE RIVER NR. LAWRENCEVILLE, PA.

WATER QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	BICARBONATE (MG/L AS HCO3)	CARBONATE (MG/L AS CO3)	ALKALINITY (MG/L AS CACO3)	CARBON DIOXIDE DISSOLVED (MG/L AS CO2)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	NITROGEN, NITRATE TOTAL (MG/L AS N)	NITROGEN, NITRITE TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)
OCT									
07...	83	0	71	8.4	26	12	1.2	--	--
NOV									
11...	58	0	47	7.4	21	8.5	.38	--	--
DEC									
11...	60	0	46	6.1	20	7.9	.39	.01	.40
JAN									
07...	70	0	55	7.1	27	14	--	--	--
FEB									
05...	55	0	65	18	25	10	--	--	--
MAR									
09...	44	0	35	5.6	22	7.5	.79	--	--
APR									
06...	44	6	46	.1	22	8.9	--	--	--
MAY									
06...	67	0	57	.3	21	8.8	--	--	--
JUN									
02...	62	0	52	5.0	15	5.1	.40	.04	.44
JUL									
13...	98	0	80	1.6	29	12	--	--	--
AUG									
11...	103	0	85	.8	24	17	--	--	--
SEP									
08...	115	0	95	1.2	39	38	.00	.01	.01

DATE	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHORUS, ORTHO, TOTAL (MG/L AS P)	SEDIMENT, SUSPENDED (MG/L)	SEDIMENT DISCHARGE, SUSPENDED (T/DAY)
OCT								
07...	.07	.51	.58	1.8	.06	.03	14	5.9
NOV								
11...	.04	.63	.67	1.0	.12	.10	208	152
DEC								
11...	.03	.23	.26	.66	.06	.02	17	21
JAN								
07...	--	--	--	--	--	--	60	--
FEB								
05...	--	--	--	--	--	--	60	--
MAR								
09...	.09	.26	.35	1.1	.03	.02	12	13
APR								
06...	--	--	--	--	--	--	3	1.7
MAY								
06...	--	--	--	--	--	--	10	4.1
JUN								
02...	.05	.78	.83	1.3	.18	.05	191	221
JUL								
13...	--	--	--	--	--	--	60	--
AUG								
11...	--	--	--	--	--	--	60	--
SEP								
08...	.01	.27	.28	.29	.03	.02	60	--

Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01520000 - COWANESQUE RIVER NR. LAWRENCEVILLE, PA.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	ACIDITY TOTAL HEATED (MG/L AS H)	ACIDITY (MG/L AS CaCO3)	BICAR-BONATE (MG/L AS HCO3)	CAR-BONATE (MG/L AS CO3)
OCT											
07...	1215	21	316	8.6	15.5	10.1	100	.0	.0	113	1
NOV											
10...	1150	110	328	7.6	2.0	14.0	101	.0	2.0	73	0
DEC											
15...	0925	1150	236	6.6	.0	13.6	93	.1	7.0	62	0
MAR											
08...	0940	643	165	7.0	2.0	13.6	93	.0	2.0	37	0
APR											
14...	0920	256	184	8.2	13.0	11.8	111	.0	1.0	64	0
MAY											
03...	1005	154	192	7.5	12.5	12.4	116	.2	8.0	66	0
JUN											
10...	1110	791	314	8.0	12.5	10.1	94	.0	2.0	98	0
JUL											
07...	1000	1020	131	7.5	19.5	7.9	85	.0	2.0	39	0
AUG											
09...	1010	213	201	8.3	22.5	9.2	105	.0	.0	74	0
SEP											
14...	0940	230	220	7.9	15.0	9.4	92	.0	2.0	73	0

DATE	ALKA-LINITY (MG/L AS CaCO3)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)
OCT											
07...	94	.5	33	44	--	--	--	--	--	--	--
NOV											
10...	60	2.9	24	15	--	--	--	--	--	--	--
DEC											
15...	51	25	26	12	.70	--	.01	--	.71	--	.00
MAR											
08...	30	5.9	19	9.1	.75	--	.02	--	.77	--	.05
APR											
14...	44	.5	23	10	--	--	--	--	--	--	--
MAY											
03...	65	2.0	21	13	--	--	--	--	--	--	--
JUN											
10...	80	1.6	26	27	.61	--	.06	--	65	--	.11
JUL											
07...	32	2.0	14	5.1	--	--	--	--	--	--	--
AUG											
09...	61	.6	16	9.0	--	--	--	--	--	--	--
SEP											
14...	60	1.5	21	14	--	.58	--	.01	--	.59	--

DATE	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA + ORGANIC DIS. (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, DIS-SOLVED (MG/L AS P)	PHOS-PHORUS, ORTHO, TOTAL (MG/L AS P)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT DIS-CHARGE, SUS-PENDED (T/DAY)
OCT											
07...	--	--	--	--	--	--	--	--	--	12	.68
NOV											
10...	--	--	--	--	--	--	--	--	--	7	2.5
DEC											
15...	--	.18	--	.18	--	.89	.03	--	.01	14	--
MAR											
08...	--	.48	--	.51	--	1.3	.06	--	.02	33	34
APR											
14...	--	--	--	--	--	--	--	--	--	6	2.8
MAY											
03...	--	--	--	--	--	--	--	--	--	6	2.5
JUN											
10...	--	.45	--	76	--	1.4	.08	--	.00	75	61
JUL											
07...	--	--	--	--	--	--	--	--	--	996	2760
AUG											
09...	--	--	--	--	--	--	--	--	--	25	14
SEP											
14...	.07	--	.51	--	.54	--	--	02	--	67	38

Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01520500 - TIOGA RIVER AT LINDLEY NY

WATER QUALITY DATA, WATER YEAR OCTOBER 1973 TO SEPTEMBER 1974

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	ACIDITY TOTAL HEATED (MG/L AS H)	ACIDITY (MG/L AS CACO3)	BICAR-BONATE (MG/L AS HCO3)	CAR-BONATE (MG/L AS CO3)	ALKA-LINITY (MG/L AS CACO3)
OCT												
09...	1825	182	268	6.8	17.0	10.2	105	--	--	48	0	41
NOV												
06...	1600	405	182	7.0	5.0	11.6	91	.0	--	38	0	31
DEC												
11...	1545	1630	148	6.7	2.5	12.7	93	.1	5.0	24	0	20
JAN												
08...	1450	440	200	6.8	.0	13.8	94	.2	--	32	0	27
FEB												
14...	1530	E500	153	6.7	.5	14.0	97	.1	--	35	0	28
MAR												
14...	1400	E1160	143	6.7	2.0	13.4	97	.1	--	24	0	18
APR												
03...	1710	3280	118	6.2	6.5	12.2	99	.0	--	24	0	20
MAY												
02...	1430	604	172	7.4	14.0	10.7	103	.0	3.0	38	0	33
JUN												
13...	1430	172	216	7.2	20.0	--	--	.0	--	44	0	40
JUL												
18...	1245	119	269	7.2	24.0	9.0	106	.1	6.0	36	0	47
AUG												
15...	1355	63	328	7.4	25.0	9.2	110	.0	--	42	0	34
SEP												
13...	1500	83	342	7.4	24.0	8.4	99	.0	--	44	0	36

DATE	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, ORTHO, TOTAL (MG/L AS P)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT DIS-CHARGE, SUS-PENDED (T/DAY)
OCT												
09...	12	41	16	.08	.04	.16	.20	.28	.03	.02	3	1.5
NOV												
06...	6.1	49	8.5	.34	.16	.25	.41	.15	.05	.02	10	11
DEC												
11...	7.7	35	6.8	.66	.04	.23	.27	.93	.07	.05	39	172
JAN												
08...	8.1	46	15	1.0	.13	.21	.34	1.3	.03	.01	10	12
FEB												
14...	11	31	10	.70	.20	.35	.55	1.2	.05	.03	E0	--
MAR												
14...	7.7	28	5.4	.77	.09	.18	.27	1.0	.02	.02	22	54
APR												
03...	24	23	4.0	.70	.16	.45	.61	1.3	.10	.03	35	310
MAY												
02...	2.4	39	7.4	.20	.08	.20	.28	.48	.03	.01	10	16
JUN												
13...	4.4	56	10	.36	.13	.22	.35	.71	.02	.01	4	1.9
JUL												
18...	3.6	73	12	.09	.07	.15	.22	.31	.01	.00	1	.32
AUG												
15...	2.7	92	17	.16	.16	.22	.38	.54	.02	.00	5	.85
SEP												
13...	2.8	84	20	.18	.09	.16	.25	.43	.01	.00	E0	--

Table 24.- Water-quality data collected from September 1973 to September 1978--Continued

01520500 - TIOGA RIVER AT LINDLEY NY

WATER QUALITY DATA, WATER YEAR OCTOBER 1973 TO SEPTEMBER 1974

DATE	TIME	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	COBALT, TOTAL RECOVERABLE (UG/L AS CO)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)
FEB								
14...	1530	--	--	--	--	--	--	--
MAR								
14...	1400	--	--	--	--	--	--	--
APR								
04...	1710	--	--	--	--	--	--	--
MAY								
02...	1430	700	1	0	0	9	20	490
JUN								
13...	1430	0	1	0	<10	9	10	180
JUL								
10...	1245	200	1	1	0	14	20	0
AUG								
15...	1355	80	0	0	0	13	0	70
SEP								
13...	1500	40	1	0	<10	20	10	150

DATE	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	SELENIUM, TOTAL (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)
FEB							
14...	20	--	--	--	--	--	--
MAY							
14...	50	--	--	--	--	--	--
APR							
04...	80	--	--	--	--	--	--
MAY							
02...	--	14	570	.5	0	0	130
JUN							
13...	--	1	390	<.5	<1	0	60
JUL							
10...	--	1	2300	<.5	<1	0	310
AUG							
15...	--	0	1200	<.5	0	0	100
SEP							
13...	--	2	1500	<.5	2	0	200

WATER QUALITY DATA, WATER YEAR OCTOBER 1974 TO SEPTEMBER 1975

DATE	TIME	STREAMFLOW, INSTANTANEOUS (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	ACIDITY TOTAL HEATED (MG/L AS H)	ACIDITY (MG/L AS CACO3)
OCT									
11...	1115	90	329	7.5	11.0	10.6	96	.0	3.0
NOV									
07...	1530	470	203	7.0	8.5	12.8	109	.0	6.0
DEC									
10...	1015	2040	125	7.1	.5	14.8	103	.2	4.0
JAN									
15...	1030	E1100	157	7.0	.0	--	--	.1	2.0
FEB									
04...	1015	E540	176	7.4	.0	14.0	96	.0	5.0
MAR									
06...	0930	722	177	6.6	.5	12.7	88	.0	7.0
APR									
02...	0950	728	142	7.2	4.5	11.4	90	.0	7.0
MAY									
15...	1000	755	151	7.7	14.5	8.8	85	.1	2.0
JUN									
10...	1000	1070	159	7.1	18.0	9.2	97	.0	5.0
JUL									
10...	0920	210	238	7.2	22.0	7.1	81	.1	7.0
AUG									
07...	1015	189	311	6.6	19.0	7.9	84	.1	13
SEP									
11...	1550	110	277	7.8	19.5	7.8	84	.0	2.0

Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01520500 - TIOGA RIVER AT LINDLEY NY

WATER QUALITY DATA, WATER YEAR OCTOBER 1974 TO SEPTEMBER 1975

DATE	BICARBONATE (MG/L AS HCO3)	CARBONATE (MG/L AS CO3)	ALKALINITY (MG/L AS CACO3)	CARBON DIOXIDE DISSOLVED (MG/L AS CO2)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	NITROGEN, NITRATE TOTAL (MG/L AS N)	NITROGEN, NITRITE TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)
OCT									
11...	44	0	36	2.2	93	18	.18	--	--
NOV									
07...	52	0	43	8.3	41	11	.32	--	--
DEC									
10...	18	0	31	2.3	31	5.5	.70	--	--
JAN									
15...	22	0	20	3.5	44	6.5	.86	--	--
FEB									
04...	28	0	24	1.8	49	8.0	.86	--	--
MAR									
06...	26	0	22	10	48	8.0	1.2	--	--
APR									
02...	29	0	23	2.9	39	7.0	.72	--	--
MAY									
15...	35	0	31	1.1	32	5.5	.23	.01	.24
JUN									
10...	40	0	32	5.1	33	5.0	.70	--	--
JUL									
10...	57	0	47	5.8	48	14	.47	--	--
AUG									
07...	56	0	45	23	81	18	.31	.01	.32
SEP									
11...	56	0	49	1.3	63	16	.11	--	--

DATE	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHORUS, ORTHO, TOTAL (MG/L AS P)	SEDIMENT, SUSPENDED (MG/L)	SEDIMENT DISCHARGE, SUSPENDED (T/DAY)
OCT								
11...	.10	.18	.28	.46	.01	.00	E0	--
NOV								
07...	.01	.32	.33	.65	.04	.02	9	12
DEC								
10...	.09	.33	.42	1.1	.07	.05	29	160
JAN								
15...	.07	.30	.37	1.2	.03	.03	10	28
FEB								
04...	.05	.29	.34	1.2	.02	.02	E0	--
MAR								
06...	.03	.25	.28	1.5	.03	.02	18	35
APR								
02...	.01	.23	.24	.96	.03	.02	15	29
MAY								
15...	.01	.12	.13	.37	.03	.01	13	27
JUN								
10...	.01	.31	.32	1.0	.06	.05	51	147
JUL								
10...	.07	.44	.51	.98	.08	.03	34	19
AUG								
07...	.04	.18	.22	.54	.08	.01	14	7.1
SEP								
11...	.02	.14	.16	.27	.02	.01	E0	--

Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01520500 - TIOGA RIVER AT LINDLEY NY

WATER QUALITY DATA, WATER YEAR OCTOBER 1974 TO SEPTEMBER 1975

DATE	TIME	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	ARSENIC DISSOLVED (UG/L AS AS)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CADMIUM DISSOLVED (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	CHROMIUM, DISSOLVED (UG/L AS CR)
OCT									
11...	1115	230	--	<1	--	0	--	0	--
NOV									
07...	1530	540	--	1	--	0	--	10	--
DEC									
10...	1015	920	--	0	--	0	--	0	--
JAN									
15...	1030	670	--	1	--	1	--	0	--
FEB									
04...	1015	470	--	2	--	0	--	0	--
MAR									
06...	0930	--	30	--	0	--	0	--	0
APR									
02...	0950	--	20	--	1	--	0	--	0
MAY									
15...	1000	--	50	--	1	--	0	--	10
JUN									
10...	1800	--	60	--	0	--	0	--	0
JUL									
10...	0920	950	70	1	0	0	0	0	<10
AUG									
07...	1015	--	10	--	--	--	--	--	--
SEP									
11...	1550	500	100	--	--	--	--	--	--

DATE	COBALT, TOTAL RECOVERABLE (UG/L AS CO)	COBALT, DISSOLVED (UG/L AS CO)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	COPPER, DISSOLVED (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	LEAD, DISSOLVED (UG/L AS PB)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)
OCT									
11...	35	--	0	--	160	--	0	--	2000
NOV									
07...	5	--	0	--	650	--	1	--	380
DEC									
10...	7	--	0	--	1200	--	5	--	360
JAN									
15...	13	--	10	--	900	--	2	--	660
FEB									
04...	14	--	10	--	930	--	3	--	850
MAR									
06...	--	13	--	10	--	310	--	2	--
APR									
02...	--	10	--	0	--	180	--	0	--
MAY									
15...	--	4	--	0	--	70	--	1	--
JUN									
10...	--	6	--	10	--	60	--	1	--
JUL									
10...	6	4	0	10	1700	90	12	1	610
AUG									
07...	--	--	--	--	--	20	--	--	--
SEP									
11...	--	--	--	--	460	20	--	--	830

Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01520500 - TIOGA RIVER AT LINDLEY NY

WATER QUALITY DATA, WATER YEAR OCTOBER 1974 TO SEPTEMBER 1975

DATE	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	MERCURY DISSOLVED (UG/L AS HG)	SELENIUM, TOTAL (UG/L AS SE)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	SILVER, DISSOLVED (UG/L AS AG)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	ZINC, DISSOLVED (UG/L AS ZN)
OCT									
11...	--	<.5	--	2	--	0	--	290	--
NOV									
07...	--	<.5	--	0	--	0	--	80	--
DEC									
10...	--	<.5	--	0	--	0	--	50	--
JAN									
15...	--	<.5	--	0	--	0	--	50	--
FEB									
04...	--	<.5	--	0	--	0	--	110	--
MAR									
06...	790	--	<.5	--	0	--	0	--	90
APR									
02...	590	--	<.5	--	1	--	0	--	60
MAY									
15...	390	--	<.5	--	0	--	0	--	40
JUN									
10...	420	--	<.5	--	0	--	0	--	10
JUL									
10...	560	<.5	<.5	0	0	0	0	60	20
AUG									
07...	1200	--	--	--	--	--	--	--	60
SEP									
11...	800	--	--	--	--	--	--	70	60

WATER QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	TIME	STREAMFLOW, INSTANTANEOUS (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	ACIDITY TOTAL HEATED (MG/L AS H)	ACIDITY (MG/L AS CACO3)
OCT									
07...	1515	610	238	7.1	14.0	9.4	92	.1	6.0
NOV									
11...	1530	1010	176	7.1	10.5	10.0	89	.1	4.0
DEC									
11...	0845	1530	145	6.1	1.5	12.9	92	.1	5.0
JAN									
07...	1515	E500	210	7.2	.0	13.4	92	.1	5.0
FEB									
05...	1215	E660	171	7.4	.0	13.6	93	.1	3.0
MAR									
09...	1245	E1100	147	6.7	1.5	13.3	95	.0	3.0
APR									
06...	1425	925	153	7.5	8.0	12.5	105	.1	3.0
MAY									
06...	1350	435	200	7.4	14.5	9.8	95	--	3.0
JUN									
02...	1315	1010	156	7.5	16.0	9.2	92	.1	2.0
JUL									
14...	1320	285	238	7.5	17.0	8.3	86	.0	2.0
AUG									
11...	1200	478	193	7.6	20.0	8.6	94	.0	2.0
SEP									
08...	1200	79	353	7.4	19.0	9.0	96	.1	3.0

Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01520500 - TIOGA RIVER AT LINDLEY NY

WATER QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	BICARBONATE (MG/L AS HCO3)	CARBONATE (MG/L AS CO3)	ALKALINITY (MG/L AS CACO3)	CARBON DIOXIDE DISSOLVED (MG/L AS CO2)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	NITROGEN, NITRATE TOTAL (MG/L AS N)	NITROGEN, NITRITE TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)
OCT									
07...	45	0	40	6.7	59	9.0	.93	--	--
NOV									
11...	47	0	37	6.0	33	7.0	.41	--	--
DEC									
11...	40	0	31	51	26	6.5	.52	.01	.53
JAN									
07...	42	0	36	4.2	47	8.5	--	--	--
FEB									
05...	34	0	28	2.2	41	8.5	--	--	--
MAR									
09...	26	0	22	8.3	37	6.0	.70	--	--
APR									
06...	35	0	27	1.8	34	7.0	--	--	--
MAY									
06...	--	--	34	--	--	7.1	--	--	--
JUN									
02...	47	0	41	2.4	28	4.9	.31	.03	.34
JUL									
13...	52	0	43	2.6	61	6.9	--	--	--
AUG									
11...	42	0	34	1.7	49	6.9	--	--	--
SEP									
08...	39	0	32	2.5	110	14	.27	.01	.28

DATE	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHORUS, ORTHO, TOTAL (MG/L AS P)	SEDIMENT, SUSPENDED (MG/L)	SEDIMENT DISCHARGE, SUSPENDED (T/DAY)
OCT								
07...	.07	.30	.37	1.3	.06	.03	48	79
NOV								
11...	.03	.61	.64	1.0	.13	.07	111	303
DEC								
11...	.03	.25	.28	.81	.07	.01	47	194
JAN								
07...	--	--	--	--	--	--	21	--
FEB								
05...	--	--	--	--	--	--	50	--
MAR								
09...	.06	.22	.28	.98	.05	.02	17	55
APR								
06...	--	--	--	--	--	--	4	10
MAY								
06...	--	--	--	--	--	--	9	11
JUN								
02...	.04	.61	.65	.99	.17	.04	157	428
JUL								
13...	--	--	--	--	--	--	9	6.9
AUG								
11...	--	--	--	--	--	--	15	19
SEP								
08...	.03	.10	.13	.41	.02	.01	18	3.8

DATE	TIME	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	ALUMINUM, DISSOLVED (UG/L AS AL)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, DISSOLVED (UG/L AS MN)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	ZINC, DISSOLVED (UG/L AS ZN)
OCT									
07...	1515	380	120	2100	20	1400	1400	120	90
NOV									
11...	1530	2600	30	4700	120	520	450	130	70
DEC									
11...	0845	1200	30	3000	40	260	250	40	30

Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01304500 - TIOGA RIVER AT LINDLEY NY

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	STREAM-FLOW, INSTANTANEOUS (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	ACIDITY TOTAL HEATED (MG/L AS H)	ACIDITY (MG/L AS CACO3)	BICARBONATE (MG/L AS HCO3)	CARBONATE (MG/L AS CO3)
OCT											
07...	1215	93	459	8.4	15.5	9.4	93	.0	.0	62	1
NOV											
10...	1215	447	209	7.1	1.5	13.0	93	.1	4.0	41	0
DEC											
15...	1010	E450	191	6.5	.0	13.6	93	.1	7.0	43	0
JAN											
13...	1135	1140	272	6.9	.0	12.6	86	.3	13	47	0
FEB											
09...	0940	592	307	6.6	.0	12.3	84	.3	14	50	0
MAR											
09...	0945	1370	155	6.8	1.0	13.4	94	.1	5.0	17	0
APR											
14...	1000	702	184	7.0	13.0	10.0	94	.1	4.0	30	0
MAY											
03...	1030	562	183	6.5	11.5	10.5	96	.2	8.0	28	0
JUN											
10...	1130	E700	248	7.7	12.5	9.6	92	.1	4.0	51	0
JUL											
07...	1015	1400	168	7.4	20.5	7.6	84	.1	4.0	37	0
AUG											
09...	1100	384	137	7.9	23.5	8.0	93	.0	2.0	67	0
SEP											
14...	1010	268	240	7.7	15.5	9.1	98	.0	2.0	66	0

DATE	ACIDITY (MG/L AS CACO3)	CARBON DIOXIDE DISSOLVED (MG/L AS CO2)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE DISSOLVED (MG/L AS CL)	NITROGEN, NITRATE TOTAL (MG/L AS N)	NITROGEN, NITRATE DISSOLVED (MG/L AS N)	NITROGEN, NITRITE TOTAL (MG/L AS N)	NITROGEN, NITRITE DISSOLVED (MG/L AS N)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)
OCT											
07...	52	.4	93	13	--	--	--	--	--	--	--
NOV											
10...	34	5.2	50	8.2	--	--	--	--	--	--	--
DEC											
15...	35	22	40	9.9	.66	--	.01	--	.67	--	.02
JAN											
13...	38	7.5	67	14	--	--	--	--	--	--	--
FEB											
09...	41	20	74	17	--	--	--	--	--	--	--
MAR											
09...	14	4.3	34	7.2	.73	--	.05	--	.78	--	.06
APR											
14...	25	4.3	42	7.7	--	--	--	--	--	--	--
MAY											
03...	21	14	21	11	--	--	--	--	--	--	--
JUN											
10...	42	1.6	63	14	.38	--	.01	--	.39	--	.02
JUL											
07...	30	2.4	29	5.5	--	--	--	--	--	--	--
AUG											
09...	50	1.3	35	9.4	--	--	--	--	--	--	--
SEP											
14...	54	2.1	41	13	--	.51	--	.01	--	.52	--

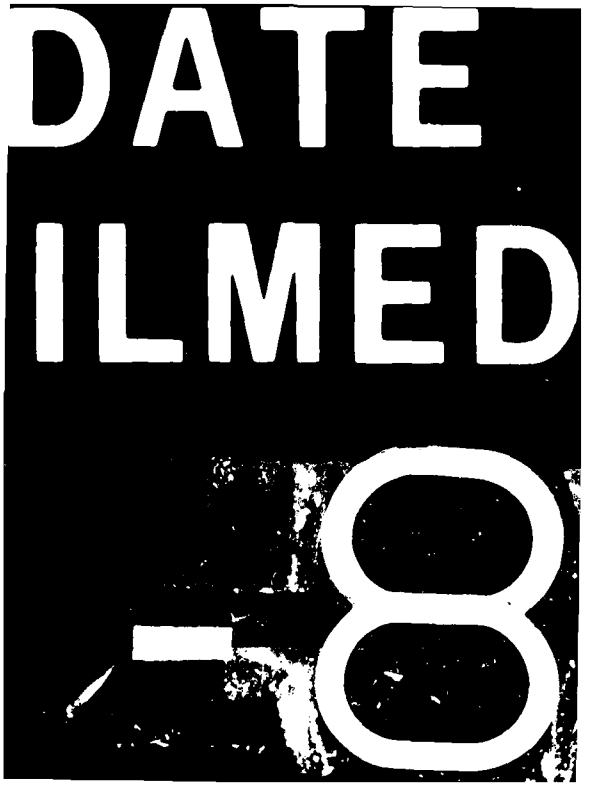
Table 24.--Water-quality data collected from September 1973 to September 1978--Continued

01520500 - TIOGA RIVER AT LINDLEY NY

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA + ORGANIC DIS. (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, DIS-SOLVED (MG/L AS P)	PHOS-PHORUS, ORTHO, TOTAL (MG/L AS P)	SEDI-MENT, SUS-PENDED (MG/L)	SEDIMENT DIS-CHARGE, SUS-PENDED (T/DAY)
OCT											
07...	--	--	--	--	--	--	--	--	--	17	3.8
NOV											
10...	--	--	--	--	--	--	--	--	--	22	26
DEC											
15...	--	.16	--	.18	--	.85	.03	--	.01	6	--
JAN											
13...	--	--	--	--	--	--	--	--	--	E0	--
FEB											
09...	--	--	--	--	--	--	--	--	--	2	--
MAR											
08...	--	.34	--	.40	--	1.2	.04	--	.01	37	137
APR											
14...	--	--	--	--	--	--	--	--	--	12	23
MAY											
03...	--	--	--	--	--	--	--	--	--	11	17
JUN											
10...	--	.21	--	.23	--	.62	.01	--	.00	21	--
JUL											
07...	--	--	--	--	--	--	--	--	--	1230	4650
AUG											
09...	--	--	--	--	--	--	--	--	--	39	32
SEP											
16...	.04	--	.64	--	.73	--	--	.02	--	86	62

U S GOVERNMENT PRINTING OFFICE 1981 - 706-020-211


DATE
ILMED
-8